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EARNINGS OF FACTORY WORKERS 1899 TO 1927

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AN ANALYSIS OF PAY-ROLL STATISTICS

BY

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This work rests chiefly upon the official returns from the quinquennial and biennial censuses of manufactures, published by the Bureau of the Census of the United States Department of Commerce. Some use has been made, as well, of the statistical data on wages, earnings, and employment collected by the United States Bureau of Labor Statistics, the Massachusetts Department of Labor and Industries, the New York Industrial Commission, the Wisconsin Industrial Commission, the New Jersey Bureau of Labor Statistics, and the Federal Reserve Bank of New York.

Through the courtesy of the Harvard Committee on Economic Research, the National Bureau of Economic Research, the National Industrial Conference Board, and the Helen S. Trounstine Foundation of Cincinnati, Ohio, it has been possible to make supplementary use of some of their statistical material. The customary footnote citations more particularly describe the unofficial material that has been used. A complete list of the official and unofficial sources used or cited in the following pages is printed as an appendix.

The statistical data collected by the National Bureau of Economic Research have been drawn upon more heavily than is the case with any of the other unofficial agencies whose statistical output has been used in this analysis. The national bureau has generously allowed the use, not only of material from several of its published reports, but also of some important unpublished figures. It should be noted, perhaps, that the national bureau report of which most use has been made in this monograph is, as a matter of fact, a semiofficial document which presents, under the title, Employment, Hours, and Earnings in Prosperity and Depression, the "results of an inquiry conducted by the National Bureau of Economic Research with the help of the Bureau of Markets and Crop Estimates of the United States Department of Agriculture, and the Bureau of the Census for the President's Conference on Unemployment."

As this monograph goes to the printer complete results of the biennial census of manufactures for 1927 are not available. Some estimates have been made, nevertheless, of per capita earnings in that year. These, like the interpolated estimates given for intercensal years, are based, in part, upon noncensus data. Census materials enter into them, however, since the data of the 1925 manufactures census are used as points of departure for the exterpolation of the estimates for 1927. Some basic figures from the reports of the 1927 manufactures census are given in Appendix V.

FOREWORD

The Federal Census nas been gathering statistics of wages in manufacturing establishments at 10-year, 5-year, or 2-year intervals ever since 1850. An enormous quantity of data on a matter of vital concern to our people has thus been accumulated. But grave doubts concerning the reliability of the figures have restricted their use.

Before the Twelfth Census was taken in 1900, changes in the questions asked on the manufacturing schedules concerning wages, changes in the methods of field work, and changes in the industrial scope of the enumerations compromised comparisons between the tables in successive reports. In addition there was the perennial question, what meaning can be attached to figures for "average wages" computed from number of employees (however reported) and total pay rolls. The officials of the Census Bureau were keenly conscious of the uncertainty of their results, and time after time warned readers against drawing what seemed obvious conclusions. How unfavorable a view university statisticians took of the data was shown by the discriminating paper on Wage Statistics and the Federal Census which Prof. Charles J. Bullock contributed in 1899 to the volume called The Federal Census: Critical Essays by Members of the American Economic Association.

On the establishment of a permanent census office and the adoption of a quinquennial enumeration of manufactures, fresh efforts were made to improve the quality of the wage figures, and to conduct successive enumerations in such manner as to secure comparable returns. But statisticians both within and without the Census Bureau have continued to question the results. To determine what the wage returns mean, how they can best be used, and what confidence can be felt in them, required careful scrutiny of the internal evidence afforded by the census data themselves, and extensive comparisons with data collected by other agencies. When a series of Census Monographs was planned in 1920, it became feasible to make a more thorough examination of the whole problem than was appropriate in the regular census reports.

Prof. Paul F. Brissenden, of Columbia University, to whom this task was intrusted, had learned the difficulties of interpreting pay rolls as a field agent of the United States Bureau of Labor Statistics. As a student, teacher, and writer on labor problems he knew the literature of the field, and how to make the best of imperfect materials. In carrying out the present investigations, he had the

further advantage of counsel and support from the staff of the Census Bureau.

An eager and critical group of readers awaits this volume. Everyone who uses American wage data extensively must utilize the new assay of the census figures here presented. Those who have made or studied other investigations of changes in wage rates or earnings will compare Doctor Brissenden's tables with earlier conclusions, and look narrowly into the discrepancies. Men interested in statistical technique will scrutinize the methods employed. Economists will analyze the theoretical concepts on which the discussion rests. Representatives of labor and of capital will debate the results in the light of their own observations. It is a formidable gantlet which Doctor Brissenden's monograph must run.

Writing for such critically interested readers rather than for the general public, Doctor Brissenden has adapted his treatment to their needs. He discriminates with care among the different meanings of the baffling word "wages," gives formal definitions of the technical terms he uses, explains how the census figures are gathered in the field and worked up at headquarters, sets forth minutely the steps in his own processes of elaboration, checks his results with those of other investigators, and discusses the margins of error to which these results are subject. Census volumes are not light reading; but they have their own devoted public. This public, with additions from the labor field, will be grateful that Doctor Brissenden lets them share step by step in the progress of his work, and see every uncertainty which he glimpses in the outcome.

The best introduction to the book is the table of contents. This table has been made full enough to show the reader what he may expect to find in the volume as a whole, and where to look for particular items. The leading problems are raised in Chapter I, and the leading conclusions are stated in Chapter II. But readers who share the thoroughness of the author of the monograph will not be content with a cursory survey of the ground; they will push on to the later chapters which deal with the several topics in full detail. No skill in exposition could make the reading easy; but the book is packed with interest for all who really wish to know how labor incomes have fluctuated in the United States since 1899.

Earlier students of labor conditions have often worked with index numbers of wage rates—not because they preferred such materials, but because they had nothing better at hand. Such figures have their merits; but their defects are not less striking. For example, wage rates seldom decline so sharply after a business crisis as retail prices. "Real wages," computed by dividing indexes of cost of living into indexes of wage rates, actually rise in most periods of depression—whereas common observation is that the increase in

unemployment at such times much more than offsets the inertia of wage rates. One of the advantages of the census data is that they enable an investigator to deal with actual sums paid to wage earners on a nation-wide scale. From these data, supplemented by indexes of employment and pay-roll disbursements, Doctor Brissenden has been able to make estimates for every year since 1899 of the actual *per capita* earnings of factory employees. While he feels no great confidence in the dollar figures, he believes that the fluctuations of factory earnings from census to census are closely approximated. Finally, Doctor Brissenden applies annual indexes of cost of living to his index of actual earnings and obtains an index of purchasing power—or "real wages," to use the common term. This final index confirms the common impression that real wages fall in years of depression.

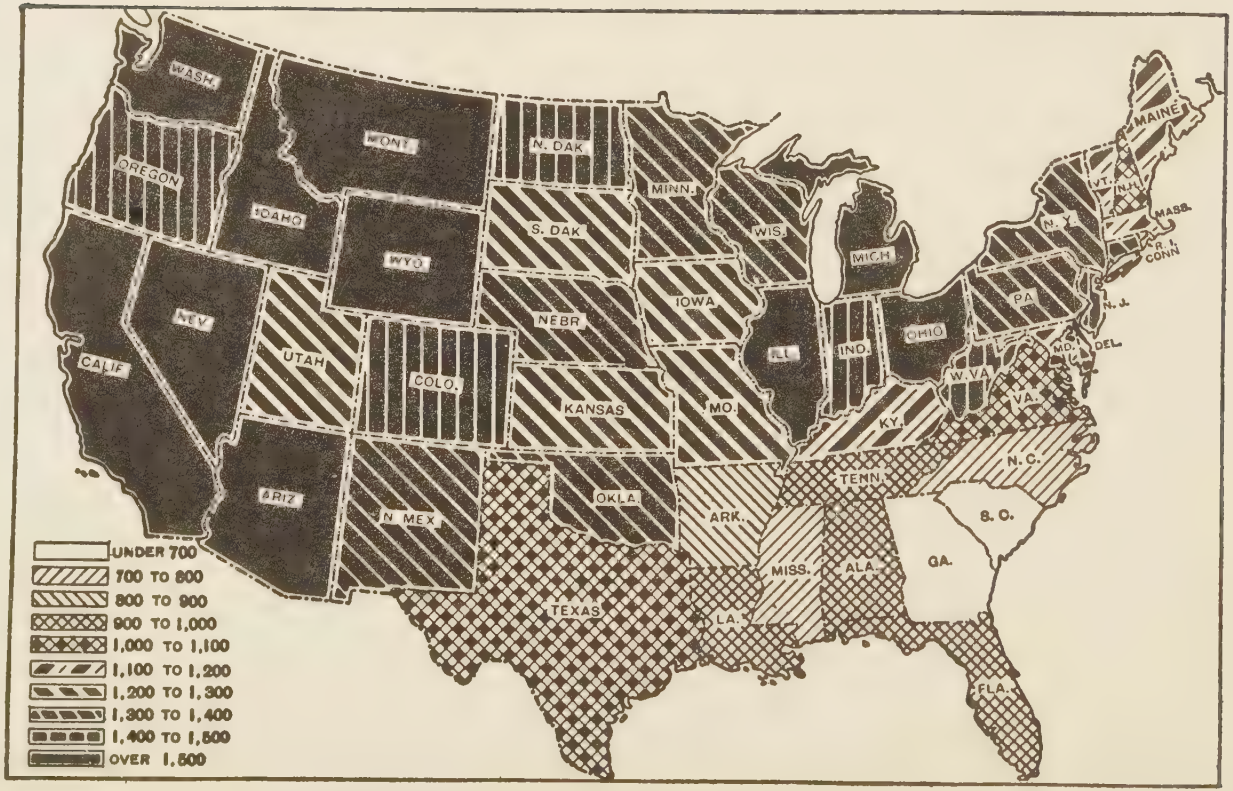
Another result of wide significance is evidence that apart from the cyclical oscillations just referred to, the real wages of American factory workers kept to a nearly constant level from 1899 to 1915. During the World War they scored a gain, which was temporarily canceled in the great business collapse of 1921. But since that calamitous year, a renewed advance has carried real wages to a level much higher than that attained in any pre-war period covered by the data. These conclusions confirm and are confirmed by certain previous investigations made by quite different methods.

Elaborate as the present study is, Doctor Brissenden has no thought of claiming to have said the final word about the value or the meaning of the census data. Unquestionably his work is a contribution to our knowledge both of the specific figures he has analyzed and of labor incomes at large. But what he has accomplished is like most scientific work in that it suggests further questions and promises to stimulate other investigators. As Doctor Brissenden's methods and results become the subject of critical inquiry, they will be corrected, modified, amplified, confirmed in ways and degrees which no one can now forecast. Every worker in the field must be grateful both to Doctor Brissenden and to the Bureau of the Census for making our largest collection of wage data more interesting and more useful.

WESLEY C. MITCHELL.

Part I

INTRODUCTORY



MANUFACTURING LABOR INCOMES, PER CAPITA, 1923

Chapter I

INTRODUCTION

The purpose of this monograph is a threefold one: To measure the *relative fluctuations* in the per capita earnings of manufacturing wage earners since the beginning of this century; to make as close an approximation as possible to the per capita *amounts* of earnings received in the successive years of the period; and to ascertain the degree and direction of any change which may have taken place since 1899 in the variability of earnings. A position of first importance is given to relative changes in earnings, because the available data are much more adequate to the production of dependable results than they are for the attainment of reliable estimates of the amounts of earnings. The data for the calculation of variability are also probably less adequate for their purpose than the data underlying calculation of per capita changes are to their purpose. In respect to all three objectives mentioned, the important qualification should be made at the outset that we are necessarily limited to a report of per capita changes, per capita amounts, and per capita estimates of variability.

The estimates which are given in the following pages are based primarily upon the results of the manufactures censuses of the United States for the census years 1899, 1904, 1909, 1914, 1919, 1921, 1923, and 1925. Although the analysis is built upon and around census material, it is by no means confined to census data, as other government agencies and at least one nongovernmental agency are drawn upon rather heavily for data, and these data play an important part in our calculations. Among the agencies whose statistical product is utilized in connection with the basic census material are: The United States Bureau of Labor Statistics, the Federal Reserve Bank of New York, the New York State Industrial Commission, the Massachusetts Department of Labor and Industries, and the Wisconsin Industrial Commission. Considerable reliance has been placed upon materials from authoritative private or semiprivate agencies, the chief of these being the National Bureau of Economic Research. The general character of the wage statistics, not only those published by the Bureau of the Census, but also the statistics of the other agencies drawn upon in this book, is discussed in some detail in Part V.

WAGES AND EARNINGS

The term "wages" is used somewhat loosely in reference to several different concepts. Perhaps the most common use of the term is to signify the rate of wages—that is to say, the amount per hour, per day, or per week paid for labor—or the rate paid for labor by unit quantity of work done. The connotation which the term seems generally to have is that of a *rate* of some kind, whether it be time or piece. Naturally, too, the word "wages" carries with it the notion of money amounts, and this means usually the money amounts of time or piece rates. The word wages is also used very generally in the sense of earnings—the aggregate amount received in his pay envelope by the wage earner during a week, month, or year.

It is, of course, a commonplace of the business world that prices undergo wide and often erratic fluctuations. This is true of the prices of things the wage earner has to buy, and being true of these things it means that rates per hour, assuming that they be rates actually paid and not merely offered rates, mean something very different in a year when prices are at a given level from what they mean in another year when the prices of the things the laborer has to buy are 50 per cent higher. The purchasing power of the wage earners' income, in order to be as great in the period of high retail prices as it was in the period of low retail prices also must be increased in its money amount by 50 per cent. Fluctuations in money earnings, in view of the often wide fluctuations in the cost of living, throw little or no light upon changes in "real" earnings. Similarly, absolute amounts of earnings, expressed in current dollars, may vary greatly from the corresponding amounts expressed in dollars of uniform purchasing power.

Wages are often spoken of as the prices of labor. It is to be remembered, however, that it is wage rates rather than wages in the sense of earnings, that are to be compared with prices; that is to say, we pay so much a pound or a peck for food and other commodities, we even pay a price for elapsed time for the hire of an automobile, and, similarly, we pay for a certain amount of labor power, or wages, measured either by the amount produced by that labor, or flatly by the time during which we command it. The rates per piece and, much less precisely, the rates per unit of elapsed time, are wage rates or prices.

Strictly speaking, rates of pay scheduled and paid on the time basis are not prices, except in so far as it is possible accurately to report the amount and kind of work done during each time unit. The price quotations over a period of time for butter, per pound of a given grade, faithfully reflect price amounts and changes and are strictly comparable from week to week. The same thing is true of

the piece rates (often called "prices") paid to workers for the production of definitely standardized commodity units. But with time rates of wages the situation is entirely different. Unskilled labor was paid, we will say, 25 cents per hour in 1914 and 50 cents per hour in 1925. But the unskilled laborer probably was more efficient in 1914 than in 1925; if so, the change in the *price* of an hour's labor of a given kind and quality is not accurately reflected by the increase from 25 to 50 cents per hour. If we could be sure that the amount and quality of work done in an hour remained uniform, then, even without exact knowledge of the amount and quality of the work, we might say, with some assurance, that changes in time rates of wages reflected changes in the prices of labor of that special kind. But to get the actual prices, not merely the changes in prices, of labor paid on the time basis, we should have to know not only that there was uniformity in the amount and quality of labor, we should also have to know that amount and be able accurately to estimate that quality. Until, therefore, we can get time wage rates which are based upon standard units of human effort, it is pointless to speak, indiscriminately, of wages as prices.

Rates of wages per hour, day, ton, yard, etc., to the extent that the wage earner has employment are translated from time rates and piece prices to accumulated earnings; the latter represent not the unit price of a certain amount of labor, but the total sum received by the wage earner during any given time for the work that he actually does or for the time during which he actually is employed. He may work long hours throughout the period at low rates and so accumulate earnings larger than a fellow worker who is employed at much higher rates but only for a part of the same period. It is of course the earnings rather than the rates which (prices being equal, or price inequalities accounted for) measure the economic welfare of the wage earner. The following formal definitions will indicate the meanings attached to certain expressions which have frequent use in these pages:

"*Hypothetical full-time annual earnings:*" What is probably a rough approximation to a time rate of wages and generally used in this monograph in reference to yearly periods.[1] The amounts of hypothetical full-time earnings are calculated by multiplying full-time weekly earnings (hypothetical, also, but within narrower margins) by the number of weeks in a full-time working year (assumed for the purpose of this monograph to be 51).

"*Money (or nominal) earnings:*" Amount of earnings estimated actually to have been received in dollars of current purchasing power.

[1] It should be noted that these "hypothetical full-time (annual) earnings" will prove to be genuine rates only in so far as the scale of rates remains throughout the year at or very near to the rate paid in the week from which the "hypothetical full-time earnings" estimate was derived. (See Ch. XIV.)

"*Real (or commodity) earnings:*" Amount of earnings estimated actually to have been received, but expressed in dollars of constant purchasing power—commodity dollars.

"*Census average wage:*"[2] The quotient obtained by dividing the published census "amount paid in wages" by the published census "average number of wage earners." The result is, formally, an average or mean amount of full-time wages; actually it is an average which seems wide of the mark in revealing *amounts* of income, although the *relative* magnitudes of these means appear to reflect *changes* in per capita full-time earnings very accurately.

'*Income:*"[3] Total personal earnings (wages) plus such other receipts as—

(1) Rent equivalent from homes owned by those occupying them.
(2) Profits from investments.
(3) Pensions.
(4) Earnings of wife and children.
(5) Receipts from—
  (*a*) Lodgers.
  (*b*) Gardens, poultry, etc.
  (*c*) Gifts.

It is with the economic welfare of manufacturing wage earners that this analysis is chiefly concerned. Upon this subject amounts of earnings, changes in earnings, and the variability of earnings all throw light. It is hoped that the results set out in these pages may throw some light on these two questions: How well off are manufacturing wage earners in different industries and different parts of the country? And a somewhat less difficult question, How much better or worse off have they been at one time than another? The *relatives* (or index numbers) of per capita earnings, showing the direction and degree of change in average earnings, are intended to bear upon the second question. The estimated, absolute dollar *amounts* of earnings have been computed with the first, and far more difficult question, in mind. Because of the greater importance, for present purposes, of real earnings, they are given more attention than money earnings, and while it has been necessary to make estimates of full-time yearly earnings (which are substantially equivalent to annual wage *rates*) these estimates have been used for the most part only as means to ends. A few figures are given, however, showing the changes in these "yearly rates" in the form of index numbers of both current money amounts and the purchasing power of these amounts. The trend of the latter would seem to indicate what changes would take place in the purchasing power of the worker's earnings if he suffered no lost time because of unemployment, underemployment, or sickness.

[2] The expression "census average wage" does not refer to any statistical term now published by the Bureau of the Census; it is used throughout this monograph to identify the quotient obtained by dividing the amount paid in wages by the average number of wage earners, both these latter terms being regularly published by the Census Bureau.

[3] The expression "labor income" is used in these pages as synonomous with earnings.

It is evident from the foregoing definitions of earnings and income that, in reporting the total earnings of manufacturing wage earners, we are not reporting their total income. Other items of income than wages appear among the receipts of large numbers of wage earners. Some of these additional items may be catalogued as "unearned income," but others, like the income from a vegetable garden, although they are not labor incomes of wage earners as such, are, nevertheless, earned incomes. The National Bureau of Economic Research estimated that the "average ratio between wages (labor income) and total income for persons having incomes of less than $2,000 was 1 : 1.095."[4] The investigations of the United States Bureau of Labor Statistics (on which, indeed, the national bureau's estimates are partly based) brought out similar proportions. The Federal bureau's investigation of the cost of living among wage earners and low-salaried people in industrial centers in 1918–19, included an inquiry into the sources and amounts of family incomes in one year. The results of the inquiry, which included 12,096 families, showed that the total average income in one year from the earnings of the husband ($1,349) was 89.2 per cent of the total average *income* per family ($1,513); that the total average *earnings* per family ($1,455), including, i. e., earnings of wife and children, was 96.1 per cent of the total average income per family.[5] We may conclude then that the total actual per capita earnings of manufacturing wage earners constitute at least 90 per cent of their total incomes. The addition of 10 per cent to the amounts of earnings reported in these pages certainly will not result in underestimates of total incomes. The National Bureau of Economic Research added "6 per cent to personal earnings in order to arrive at the total income" of persons having incomes under $2,000,[6] and that would probably be a more accurate ratio of increase for application to the results reported in this monograph.

MANUFACTURING INDUSTRY IN THE UNITED STATES

According to the census of 1920, there were in that year 41,614,248 persons engaged in gainful occupations in the United States. These gainfully employed persons are distributed among four main occupational divisions: Manufacturing and mechanical industries; mining and quarrying; agricultural; and miscellaneous gainful occupations. Leaving out of consideration the nonmanual groups, such as domestic and personal service; public and professional service; clerical; and wholesale and retail trade, the four important industrial groups into which gainfully employed labor is divided are manufacturing, transportation, mining, and agriculture. The largest of these four

[4] National Bureau of Economic Research. Income by States in 1919, p. 6. See also the National Bureau's Income in the United States, Vol. II, ch. 23.

[5] U. S. Bureau of Labor Statistics Bull., 357, Cost of Living in the United States, p. 4. See also 9 Monthly Labor Review, pp. 1704–5 (December, 1919).

[6] Income in the United States, Vol. II, p. 296.

groups is that of manufacturing industries,which employed, in 1920, 12,813,000 persons, constituting 30.8 per cent of all gainfully employed in the United States. Among these major industrial groups the only near competitor of manufacturing is agriculture, which employed, in 1920, 10,951,000, or 26.4 per cent of all gainfully employed persons. The next and third largest group is transportation, which, in 1920, employed slightly over 3,000,000 persons, or 7.4 per cent of all the gainfully employed. In the extraction of minerals 1,090,223 persons were engaged in 1920, or 2.6 per cent of the gainfully employed. The manufactures census for 1919 reports a total of 10,812,736 persons employed in manufacturing industries. An examination of the statistics of the gainfully employed back to the beginning of the present century shows that manufacturing has grown in importance relatively to other groups of gainfully employed persons; in 1900 it constituted 23 per cent, in 1910, 28 per cent, and in 1920, 31 per cent of the gainfully employed population.

We are dealing, however, not with *all* persons gainfully employed in manufacturing industries, but only with the group classified by the census as wage earners, from which are excluded proprietors or firm members, and all salaried employees, such as officers of corporations, superintendents, managers, clerks, etc. These excluded groups make up only a very small proportion of those gainfully employed in manufactures. The number of persons in each of the groups mentioned and the proportions that they form of the total of all gainfully employed in manufacturing for each census year from and including 1909 are given in Table 1.[7]

TABLE 1.—NUMBER AND PERCENTAGE DISTRIBUTION OF PERSONS ENGAGED IN MANUFACTURING INDUSTRIES: 1909–1925

CLASS	1909	1914	1919	1921	1923	1925
	NUMBER					
Total	7,678,578	8,263,063	10,812,736	8,265,821	10,282,306	9,857,697
Proprietors and firm members	273,265	262,599	269,137	172,871	148,421	133,054
Salaried employees	790,267	964,217	1,447,227	[a]1,146,380	[a]1,355,729	[a]1,340,382
Officers of corporations	80,735	92,671	132,467			
Superintendents, managers, clerks, etc.	709,532	871,546	1,314,760			
Wage earners (average number)	6,615,046	7,036,247	9,096,372	6,946,570	8,778,156	8,384,261
	PER CENT DISTRIBUTION					
Total	100.0	100.0	100.0	100.0	100.0	100.0
Proprietors and firm members	3.6	3.2	2.5	2.1	1.4	1.3
Salaried employees	10.3	11.7	13.4	13.9	13.2	13.6
Officers of corporations	1.1	1.1	1.2			
Superintendents, managers, clerks, etc.	9.2	10.5	12.2			
Wage earners (average number)	86.1	85.1	84.1	84.0	85.4	85.1

[a] Salaried officers and employees.

It appears from the figures of this table that the wage-earning group which is the subject of this monograph constituted, for the greater part of the period at any rate, between 84 and 86 per cent of all persons gainfully employed in manufacturing. Salaried employees make up of course most of the remainder of the total gainfully employed, constituting, as they did in 1909, 10 per cent; in 1914, 11 per cent; in 1919, 13 per cent; and in 1923, 13 per cent of all gainfully employed in manufacturing. The average number of wage earners has very nearly doubled since 1899. The number in 1899 was 4,712,763, and in the most recent census year, 1927, it was 8,351,257.

TABLE 2.—NUMBER OF ESTABLISHMENTS, WAGE EARNERS, WAGES, AND VALUE ADDED BY MANUFACTURE: 1899–1927 [1]

CENSUS YEAR	Number of establishments	Wage earners (average number)	Wages	Value added by manufacture
			Expressed in thousands	
	ABSOLUTE AMOUNTS			
1899	([2])	[3] 4,712,763	[3] $2,008,361	[3] $4,831,075
1904	[4] 145,018	[5] 5,362,017	[6] 2,569,503	[4] [5] 6,293,695
1909	175,142	6,472,616	3,427,038	8,385,015
1914	**177,110**	**6,896,190**	**4,067,719**	**9,709,527**
1919	214,383	9,000,059	10,461,787	24,809,093
1921	196,267	6,946,570	8,200,324	18,316,666
1923	195,714	8,778,156	10,985,895	25,853,151
1925	187,390	8,384,261	10,729,969	26,778,066
1927 [7]	191,832	8,351,257	10,848,782	27,585,793
	RELATIVES: 1914=100			
1899		68	49	50
1904	82	78	63	65
1909	99	94	84	86
1914	**100**	**100**	**100**	**100**
1919	121	131	257	256
1921	111	101	202	188
1923	111	127	270	266
1925	106	122	264	276
1927 [7]	108	121	267	284

[1] Except where otherwise indicated, only those establishments are included whose products were valued at over $5,000.

[2] Number of establishments having value of products less than $5,000 not shown separately; number of establishments including those having value of products less than $5,000 was 290,105 for 1899.

[3] Including establishments having value of products less than $5,000 and more than $500. Comparability of statistics not materially affected.

[4] Exclusive of 71,162 (32.9 per cent) establishments in which value of products was less than $5,000.

[5] Exclusive of 106,366 wage earners (1.9 per cent) in establishments in which value of products was less than $5,000.

[6] Exclusive of $40,941,804 paid in wages (1.6 per cent) in establishments in which value of products was less than $5,000.

[7] Data for 1925 from Department of Commerce news release dated Feb. 28, 1929. The figures are subject to revision. They are not strictly comparable with those of 1925, since no statistics for the coffee-roasting and spice-grinding industry were tabulated at the 1925 census. The difference caused by the elimination from the earlier censuses of the figures for this industry is not considerable; for example: The figures for 1923, with and without this industry, are as follows:

ITEM	Coffee roasting and spice grinding	
	Excluded	Included
Number of establishments	195,580	195,714
Wage earners (average number)	8,768,491	8,778,156
Wages (thousands of dollars)	$10,999,282	$10,985,895
Value added (thousands of dollars)	$25,777,615	$2[illegible]

The growth in the numbers of establishments, wage earners, amounts paid in wages, and "value added by manufacture" is reported by the census for each manufactures census year from 1899 to 1927.[8] These items and corresponding index numbers on the 1914 base are given in Table 2.

The sex and age distribution of persons engaged in manufacturing industries is shown in Table 3. In view of the importance of homogeneous material in estimating changes from census year to census year, it is worthy of note that for all industries combined, at any rate, there has been no appreciable change in the proportions of the wage earners who are women, nor has there been any appreciable change in respect to the proportion of male wage earners over 16 years of age. There has been a small though distinctly appreciable diminution in the proportion of gainfully employed children, since the beginning of the century.

TABLE 3.—EMPLOYEES IN MANUFACTURING INDUSTRIES:[1] 1904–1925

CLASS	1904	1909	1914	1919	1921	1923	1925
Superintendents, managers, clerks, and other subordinate salaried employees, total	459, 509	709, 532	871, 546	1, 314, 760	[2] 1,146, 380	[2] 1,355, 729	[2] 1, 340, 382
Males, number	381, 181	567, 360	680, 290	930, 722	[3]	[3]	[3]
Per cent of total	83. 0	80. 0	78. 1	70. 8			
Females, number	78, 328	142, 172	191, 256	384, 038	[3]	[3]	[3]
Per cent of total	17. 0	20. 0	21. 9	29. 2			
Wage earners, total number	5, 468, 383	6, 615, 046	7, 036, 247	9, 096, 372	6, 946, 570	8, 778, 156	[4] 8, 384, 261
Males 16 years of age and over	4, 242, 643	5, 163, 164	5, 525, 108	7, 202, 529	[3]	[3]	[3]
Per cent of total	77. 6	78. 1	78. 5	79. 2			
Females 16 years of age and over	1, 065, 855	1, 290, 389	1, 389, 366	1, 772, 924	[3]	[3]	[3]
Per cent of total	19. 5	19. 5	19. 7	19. 5			
Children under 16 years	159, 885	161, 493	121, 773	120, 919	[3]	[3]	[3]
Per cent of total	2. 9	2. 4	1. 7	1. 3			

[1] See Abstract of the Census of Manufactures, 1919, p. 393, for 1904 to 1919 and Biennial Census of Manufactures, 1925, p. 14, for 1921 and 1923.
[2] Includes salaried officers of corporations.
[3] No data.
[4] Not including wage earners employed in the coffee-roasting and spice-grinding industry.

A summary showing the distribution of establishments, wage earners, and amounts paid in wages, in each of the three main geographic divisions of the country is given in Table 4. These figures reflect in very striking fashion the predominant concentration of manufacturing industries in the Northeast section of the country. In that section in 1919 we find more than three times the number of establishments found in the next most important region (the South), five times the number of wage earners, and more than six times the amount paid in wages. The West lags very materially behind even the South as a center of manufacturing industry, there being in that

[8] The manufactures censuses whose results are embodied in this monograph are those of 1899, 1904, 1909, 1923, 1925, and 1927.

region only one-half as many establishments as in the South, not much more than one-third as many wage earners, and only a little more than one-half the amount paid out in wages. Rates of increase as shown at the bottom of the table would indicate that the southern and western regions are growing in importance as compared with the Northeast, the rates of increase in establishments, wage earners, and wages in those sections having generally exceeded those of the Northeast, the greatest increases of all having taken place in the West. It is partly for this reason that in the following pages we have been at some pains to show regional as well as industrial differences in earnings.

TABLE 4.—COMPARATIVE SUMMARY—NORTH, SOUTH, AND WEST: 1904–1923 [1]

SECTION	Number of establishments	Wage earners (average number)	Wages (expressed in thousands)	SECTION	PER CENT OF INCREASE [2]		
					Number of establishments	Wage earners	Wages
The North:				The North:			
1904	163,224	4,364,206	$2,138,681	1904–1909	18.8	19.1	29.6
1909	193,850	5,197,138	2,772,143	1909–1914	2.0	6.9	19.3
1914	197,754	5,558,049	3,306,549	1914–1919	3.4	28.1	155.3
1919	204,386	7,120,295	8,440,471	1919–1921	−28.0	−24.0	−21.5
1921	147,123	5,413,539	6,622,481	1921–1923	−1.0	25.7	35.4
1923	145,671	6,805,297	8,965,089	The South:			
The South:				1904–1909	46.3	27.3	36.0
1904	38,154	887,310	326,530	1909–1914	−0.1	2.9	18.7
1909	55,808	1,129,307	444,215	1914–1919	5.0	23.3	159.8
1914	55,752	1,161,570	527,178	1919–1921	−45.7	−20.7	−24.9
1919	58,540	1,431,682	1,369,759	1921–1923	2.2	27.4	27.0
1921	31,794	1,135,012	1,028,307	The West:			
1923	32,509	1,446,327	1,305,544	1904–1909	27.2	33.1	45.1
The West:				1909–1914	18.3	9.7	16.1
1904	14,802	216,867	145,234	1914–1919	22.0	71.9	195.6
1909	18,833	288,601	210,680	1919–1921	−36.2	−26.9	−23.7
1914	22,285	316,628	244,605	1921–1923	4.5	32.5	33.9
1919	27,179	544,395	723,170				
1921	17,350	398,019	551,536				
1923	18,129	527,326	738,665				

[1] See Abstract of the Census of Manufactures, 1919, p. 283, for 1904 to 1919. Figures for 1921 and 1923 compiled from Table I, pp. 1211–15, Census of Manufactures, 1923.
[2] A minus sign (−) denotes decrease.

CHARACTER OF CENSUS DATA UTILIZED

The analysis contained in the following chapters rests primarily upon two pay-roll items published in the reports of the census of manufactures: The aggregate amount paid in wages during the census year in manufacturing establishments, and the average number of wage earners employed during the year by those establishments, this average being obtained by adding together the numbers of persons on pay rolls at the middle of each month[9] and dividing the sum by 12. The form in which these items are reported to the census is indicated in the Appendix, where we have reproduced those parts of the manufactures census schedules which have to do with

[9] In 1899 and 1904 enumerators were instructed to report the "number employed during each month."

wages and earnings.[10] The manner in which these two items, the amount paid in wages and the average number of wage earners, are treated is explained elsewhere. In so far as *changes* in average earnings are concerned, these two items are the only census figures which enter in any vital way into our calculations; but in order to estimate *amounts* of per capita earnings, we have leaned very heavily upon the reported amounts of average weekly earnings for 1904, published in Census Bulletin 93, under the title "Earnings of Wage Earners, 1904". This bulletin is a supplement to the first regular quinquennial census of manufactures. For our estimates of amounts of earnings, these 1904 averages of weekly earnings have been used in conjunction with index numbers obtained, as elsewhere explained, directly from the figures representing amounts paid in wages and number of wage earners. The 1904 data on average weekly earnings, however, have had no part whatever to play in the estimates of changes in earnings. Any deficiency, therefore, which may inhere in them or any error introduced by utilization of them to show amounts of earnings, has no effect whatever upon the validity of our estimates of changes in earnings. These latter estimates, doubtless, have their own sources of error, but these have nothing to do with the utilization of the 1904 data on average weekly earnings for estimation of amounts of earnings. Considerable use has been made in a supplementary way of census figures on prevailing weekly hours of labor, but these figures have not played any part in the main analysis.

The census figures for wage payments and for numbers of wage earners are, then, the points of departure for the calculation of relative changes in earnings. These same two items used in conjunction with census items on average weekly earnings in 1904 are used as points of departure for the calculation of amounts of earnings. But in the case of both the calculation of relatives and the calculation of amounts, we would have been able to get nowhere in the quest of *actual* earnings, without the assistance of additional statistical data. The most important of the supplementary statistical material consists of two series of figures: (1) Statistics of employment, entering into an employment index, which, in conjunction with corresponding estimates of the *amount* of unemployment, we have used for the derivation (from estimated full-time earnings), of estimates of earnings for time actually worked ("actual earnings"); (2) index numbers of the cost of living from the United States Bureau of Labor Statistics, for the deflation of money earnings to show "real" earnings—i. e., earnings expressed in dollars having uniform purchasing power from year to year. The employment index is derived primarily from figures on the physical volume of production

[10] The form in which they appear in the published census reports is indicated in the second and third columns of Table 2.

published by the Harvard Committee on Economic Research. The estimates of actual amounts of unemployment, which are used as bench marks in connection with the employment index, depend largely upon estimates made by the National Bureau of Economic Research in its report on "Employment, Hours, and Earnings in Prosperity and Depression."

A full discussion of the census items lying at the base of the present analysis and also of the nature and limitations of the material taken from outside sources is given in Part V.[11] That aspect of the problem, therefore, requires no further discussion at this point. But at the very outset the fact must be emphasized that, of necessity, we are here moving in the somewhat nebulous atmosphere of averages. That necessity makes the results much less satisfactory than if we were able to present frequency distributions of the individual workers according to the annual sums actually received by them. The average, none the less, has distinct advantages. One of its merits is that it indicates in very brief compass the trend of a very large number of items. The average, moreover, is less likely to cause apprehension when the material entering into it is fairly homogeneous and when it shows a fairly pronounced tendency to concentrate at typical points. The material here dealt with is none too homogeneous, but, as pointed out elsewhere, it is probably more consistent throughout the period here surveyed than is generally supposed to be true of manufacturing industry. The data that underlie this analysis do show a pretty pronounced tendency toward concentration around the average, although that tendency is less pronounced in some parts of the period than in others.

The census of manufactures now presents separate figures for wage earners and wages for no less than 356 industries, and a considerable number of these are in turn still further subdivided. It has been necessary, therefore, for the purpose of this analysis, to select certain of the more important industries and to attempt to estimate earnings in individual industries only for those selected. In Table 5 is a list of the 41 industries which have been selected for separate estimation of earnings. Alongside the name of the industry, in the third classification column, is given its census classification number for 1919.

The industries, it will be noted, are arranged in 14 groups of industries which, in turn, are combined into 6 industrial divisions. The industry groups are the 14 which are used by the census in its published reports.[12] The 6 grand divisions are essentially those used

[11] A list of sources used or cited in this monograph is given in Appendix IV.

[12] In reporting the Biennial Census of Manufactures for 1923 a rearrangement was made and the industries assembled into 16 groups (Biennial Census of Manufactures, 1923, pp. 19–28). For the purposes of this analysis, however, the fourteen-fold grouping has been retained throughout.

by the National Bureau of Economic Research in its report on Employment, Hours, and Earnings, mentioned above.

TABLE 5.—FORTY-ONE SELECTED INDUSTRIES, BY INDUSTRY GROUPS, WITH CLASSIFICATION LETTERS AND NUMBERS

A.—FOOD, TOBACCO, AND BEVERAGES

I.—Food and kindred products:
36. Bread and other bakery products.
122. Flour-mill and gristmill products.
80(*a*). Confectionery.[1]
286, 287. Slaughtering and meat packing.

VII.—Liquors and beverages:
189. Liquors, malt.
205. Mineral and soda waters.

XI.—Tobacco manufactures:
320. Tobacco, cigars and cigarettes.

B.—TEXTILES, GARMENTS, AND LEATHER

II.—Textiles and their products:
49. Carpets and rugs, other than rag.
281. Shirts.
70. Clothing, men's.
72. Clothing, women's.
87, 88, 89. Cotton manufactures.
97. Dyeing and finishing textiles, exclusive of that done in textile mills.
176. Knit goods.
284. Silk goods.
355, 356. Woolen and worsted goods.

V.—Leather and its finished products:
30. Boots and shoes, not including rubber boots and shoes.
185. Leather, tanned, curried, and finished.

C.—LUMBER AND ITS REMANUFACTURES

IV.—Lumber and its remanufactures:
129. Furniture.
195. Lumber and timber products.
196. Lumber, planing-mill products, not including planing mills connected with sawmills.

D.—PAPER AND PRINTING

VI.—Paper and printing:
230. Paper and wood pulp.
253. Printing and publishing, book and job.
255. Printing and publishing, newspapers and periodicals.

E.—STONE, CLAY, GLASS, AND CHEMICALS

VIII.—Chemicals and allied products:
62. Chemicals.
241. Petroleum, refining.

IX.—Stone, clay, and glass products:
37, 251. Brick and tile, pottery, terra-cotta, and fire-clay products.
135. Glass.

F.—METALS, VEHICLES, RAILROAD CARS, AND MISCELLANEOUS

III.—Iron and steel and their products:
163. Iron and steel, blast furnaces.
164. Iron and steel, steel works and rolling mills.
124. Foundry and machine-shop products.

X.—Metals and metal products, other than iron and steel:
289, 290, 292. Smelting and refining, copper, lead, and zinc.

XII.—Vehicles for land transportation:
10. Automobile bodies and parts.
11. Automobiles.
57. Cars, steam-railroad, not including operations of railroad companies.

XIII.—Railroad repair shops:
54. Electric-railroad repair shops.
55. Steam-railroad repair shops.

XIV.—Miscellaneous:
2. Agricultural implements.
265. Rubber tires, tubes, and rubber goods, not elsewhere specified.
279. Shipbuilding, steel.
99. Electrical machinery, apparatus, and supplies.

[1] Including, for 1899, 1904, and 1909, industries 80(*b*), ice cream, and 63, chewing gum.

Not all of the 41 selected industries are synonomous with the individual industries as reported by the census. Such cases are indicated by the appearance of two or more classification numbers in Table 5; thus the two census industries described as "Slaughtering, wholesale, not including meat packing," and "Slaughtering and meat packing, wholesale," are combined in the present list and constitute an industry which is described as "Slaughtering and meat packing." Similar consolidations have been made in other cases: Cotton goods, cotton lace, and cotton small wares have been combined to form the cotton manufactures industry; woolen goods and worsted goods are combined to form the woolen and worsted goods industry; brick and

tile, terra-cotta, and fire-clay products are combined with pottery to form the industry indicated by the title "Brick and tile, pottery, terra-cotta, and fire-clay products;" smelting and refining of copper, lead, and zinc, respectively, have been consolidated into one industry.

REPRESENTATIVENESS OF THE SELECTED INDUSTRIES

Since we are reporting separately only 41 of the 356 industries shown in the census of manufactures, it is necessary to provide some clue to the importance of these 41 industries in manufacturing industry as a whole. It is important not only to make certain that the selected industries form a large and representative sample of manufacturing industry, but also to be assured that all through the 27-year period covered, these 41 industries and each of them have constituted sizable fractions of the groups which they are in a measure used to represent. Table 6 summarizes the situation so far as concerns the proportions between the wage earners employed in the 41 selected industries and the total number employed in the groups and divisions to which they belong. Of the 4,712,763 wage earners employed in manufacturing industries in 1899, there were 3,337,685, or 70.8 per cent, employed in the 41 selected industries; of the 9,096,372 employed in manufacturing industries in 1919, there were 6,210,038, or 68.3 per cent, employed in the selected industries. The corresponding percentages for the other census years are: 74 per cent in 1904, 75 per cent in 1909, 69 per cent in 1921, 70 per cent in 1923, and 69 per cent in 1925.[13] As regards all industries combined, therefore, the wage earners which are reported here by separate industries constituted, throughout the period covered, more than two-thirds of all manufacturing wage earners. The proportions of all wage earners included in the 6 industrial divisions and 14 industry groups, represented by the wage earners in those of the 41 selected industries coming within the group or division, are shown in the two percentage columns of Table 6. For example, in the division "Food, beverages, and tobacco," the 7 selected industries belonging therein employed both in 1899 and 1919 just 69 per cent of all of the wage earners in that division. The industry, "Tobacco, cigars and cigarettes," employed in 1899, 78 per cent and in 1919, 89 per cent of all wage earners in the tobacco manufactures group. With the single exception of the stone, clay, glass, and chemicals division, wage earners in the selected industries amounted in no case to less than 60 per cent of the entire number, employed in the several divisions. In the case of the stone, clay, glass, and chemicals division the wage earners employed in the selected industries belonging to it constituted,

[13] For further details, see Table K, p. 408. In 1899 and 1925 there have been available for separate analysis only 39 industries; data were unavailable in 1899 for "Automobile bodies and parts" and for "Chemicals," and in 1925 for "Liquors, malt," and "Mineral and soda waters."

in 1899, 43 per cent and in 1919, 40 per cent of all wage earners in the division. The most poorly represented *group* is that of chemicals and allied products, the two selected industries in that group (chemicals, and petroleum refining) having employed, in 1899, 14 per cent and in 1919, 27 per cent of all the wage earners in the group. It will be noted that both of the two industries which the census reports under the group "Railroad repair shops" have been included among the selected industries; the wage earners therein constitute, therefore, 100 per cent of all the wage earners in the group. In Table 14, on page 43, there are given the numbers of wage earners (these being in each case the census "average number") employed in each of the 41 selected industries in 1899 and in 1919, together with the percentage they constitute of the number in all manufacturing industries.

TABLE 6.—PROPORTIONS OF THE NUMBER OF WAGE EARNERS IN ALL MANUFACTURING INDUSTRIES, IN EACH OF THE 6 INDUSTRIAL DIVISIONS AND IN EACH OF THE 14 INDUSTRY GROUPS, BORNE BY THE WAGE EARNERS IN THE 41 SELECTED INDUSTRIES: 1899 AND 1919

INDUSTRIAL DIVISION AND GROUP	NUMBER OF WAGE EARNERS		PROPORTION OF THESE EMPLOYED IN THE SELECTED INDUSTRIES BELONGING IN THE GROUP (PER CENT)	
	1899	1919	1899	1919
All industries	4,712,763	9,096,372	71	68
FOOD, TOBACCO, AND BEVERAGES	489,514	897,211	69	69
Food and kindred products	301,868	684,672	62	62
Liquors and beverages	55,120	55,442	87	93
Tobacco manufactures	132,526	157,097	78	89
TEXTILES, GARMENTS, AND LEATHER	1,277,332	1,960,671	83	84
Textiles and their products	1,028,706	1,611,309	86	85
Leather and its finished products	248,626	349,362	77	81
LUMBER AND TIMBER PRODUCTS	671,696	839,008	85	84
Lumber and timber products	671,696	839,008	85	84
PAPER AND PRINTING	298,744	509,875	71	70
Paper and printing	298,744	509,875	71	70
STONE, CLAY, GLASS, AND CHEMICALS	428,254	725,667	43	40
Chemicals and allied products	196,538	427,008	14	27
Stone, clay, and glass products	231,716	298,659	68	61
METALS, VEHICLES, RAILROAD CARS, AND MISCELLANEOUS	1,547,223	4,163,940	60	59
Iron and steel and their products	745,235	1,585,712	77	57
Metals and metal products, other than iron and steel	161,463	339,469	15	11
Vehicles for land transportation	133,663	495,939	28	80
Railroad repair shops	180,620	515,709	100	100
Miscellaneous	326,242	1,227,111	43	60

REPRESENTATIVENESS OF CENSUS STATISTICS ON AVERAGE WEEKLY EARNINGS IN 1904

Since the present estimates of absolute amounts of earnings depend in a large part upon the accuracy and representativeness of average weekly earnings figures given in Census Bulletin 93, it is necessary to

inquire into the extent to which those earnings figures were representative of manufacturing industry in that year, and also to give some idea of the proportions borne by the wage earners covered by those special figures to the average number of wage earners in corresponding selected industries in 1919. The significant percentages are given in columns A and B of Table 14 on pages 42 and 43.[14] The first column (A) indicates the percentage borne by the number of wage earners employed in the selected establishments in the week reported for earnings in 1904 to the greatest number employed in all establishments at any one time in 1904. The second column (B) gives the percentages borne by the same numbers of wage earners to the average number employed in all establishments in 1919. This relationship, put concretely and using, for illustration, the data for all industries combined, means that the wage earners employed in the establishments which reported earnings in 1904, numbered in the week for which earnings were reported, 47 per cent of the largest number employed at any one time in the year 1904 in all industries combined. The percentage for bread and bakery products means, similarly, that the wage earners covered by the figures for average weekly earnings in the busiest week of 1904 constituted 65 per cent of the largest number of wage earners reported by the census for bread and bakery products in that year. The figures for the other selected industries indicate that in most cases the average earnings data for 1904 are derived from reports from establishments employing quite large proportions of all wage earners in manufacturing industry. The lowest proportion is 27 per cent in women's clothing; the highest is 86 per cent in the manufacture of steam-railroad cars. In column B of Table 14, the percentages indicate the ratio between the number of wage earners employed in the specified busiest week of 1904 in the establishments reporting earnings, to the average number employed in the whole of that same industry in 1919. These figures are given to dispose of any lurking suspicion that although the samples covered in the census statistics for weekly earnings are adequate samples for 1904, they may not have been large enough to constitute sizable proportions of the generally much larger numbers to which the work forces of most of the industries expanded between 1904 and 1919. The figures in column B are reassuring on that score. The proportions, as would be expected, are somewhat smaller than the figures for 1904, but there are only a few cases where less than one-fourth of all wage earners in the industry are represented by the statistics of earnings. For all industries combined, the number of wage earners covered in the special report on earnings in 1904 is 36 per cent of the average number of wage earners for all manufacturing industries in 1919. The only industries, indeed, where the percent-

[14] See also Table 130, p. 289.

ages are really too small to constitute an adequate sample are steel shipbuilding, automobiles, automobile bodies and parts, and, possibly, rubber goods, the percentages in these industries being 7, 5, 1, and 14 per cent, respectively. The 47 per cent for "all industries" represents 3,297,819 wage earners out of a total of 7,017,138 employed in 1904.

This analysis involves no sampling of the wage-earning population. In the case of each selected industry the figures cover *all* of the wage earners in the industry. The test of representativeness, therefore, does not need to be applied to the separate figures for any of the selected industries. Nor does it need to be applied to figures for the groups and divisions shown in Table 5, nor to the data for geographic divisions. The figures—that is to say, for the industrial groups and divisions—are figures for all employees—and all establishments—in those groups and divisions.[15] The same thing is true of the regional classifications. Averages are not made for the group "Leather and its finished products," by constructing a weighted average of our results for "Boots and shoes" and "Leather, tanned, curried, and finished." The average for leather and its finished products is obtained directly from the census figures reporting the aggregate average number of wage earners in that group and the total amount paid to wage earners in that group. Nor are averages for the division, "Textiles, garments, and leather," constructed by averaging the results for the two groups within that division—textiles and leather. The average for the group is obtained by adding together the aggregates of amounts paid in wages in each of the two groups, and by adding together also the numbers of wage earners in the two groups, dividing the first number by the second, and using the quotient (the census average wage) as the primary basis for the analysis. Similarly, the results for "All manufacturing industries" combined are directly based upon census aggregates for all of the 356 industries reported by the census.

Although we have not been obliged to resort to the somewhat doubtful device of averaging averages to get our results for larger regional and industrial groups, we have stooped to that procedure in the case of certain summary tables based on an ordinal arrangement of the 41 selected industries and the 48 States. Some of these appear in the latter part of this chapter. In these summaries, however, we do not essay to work out arithmetic means built upon other arithmetic means, but averages of a different sort—medians and decils. We have, for example, an arrangement of the average real earnings in each of the 41 selected industries in order of the magnitude of that average and showing the midmost, or median, average and above or

[15] But the Census Bureau has always excluded certain very small manufacturing establishments: In each census year from 1899 to 1919, inclusive, wage statistics were not collected from establishments having products valued at less than $500; in the censuses of 1921, 1923, 1925, and 1927 no reports on wages were collected from establishments whose products were valued at less than $5,000.

below that median average, the decil and extreme averages. This device has been utilized to make it possible the more easily to grasp the general trend in earnings and to find out how far there has been uniformity among States and among industries in respect to the typical or average wages paid.

SPECIAL ANALYSIS OF THE 1919 RETURNS

Because of the necessity we have been under of confining ourselves so entirely to a single average derived from the census items of amount paid in wages, and average number of wage earners, it was thought desirable to attempt a special examination of the original establishments schedules in certain industries and cities for the year 1919. Our purpose in doing this has been to throw some light upon the degree of variation in earnings above or below the average. The industries covered are indicated in Table 7 following.

TABLE 7.—LIST OF INDUSTRIES INCLUDED IN SPECIAL ANALYSIS OF 10,374 ESTABLISHMENTS IN 1919

INDUSTRY AND 1919 CENSUS CLASSIFICATION NUMBER	
Boots and shoes, not including rubber boots and shoes (30).	Iron and steel, steel works and rolling mills (164).
Tobacco, cigars and cigarettes (320).	Furniture (129).
Agricultural implements (2).	Petroleum refining (241).
Cotton goods (87).	Slaughtering, wholesale, not including meat packing (287).
Glass (135).	Flour-mill and gristmill products (122).
Brass, bronze, and copper products (35).	Mineral and soda waters (205).
Steam-railroad repair shops (55).	Foundry and machine-shop products (124).
Clothing, women's (72).	Printing and publishing, newspapers and periodicals (255).
Rubber tires, tubes, and rubber goods, not elsewhere specified (265).[1]	Lumber and timber products (195).
Automobiles (11).	Paper and wood pulp (230).

[1] This industry was designated prior to the 1919 census as "Rubber goods, not elsewhere specified." In the 1921 and 1923 census the industry was divided into two parts, "Rubber tires and inner tubes" and "Rubber goods, not elsewhere specified."

The method of procedure and other details are fully described in Chapter XX; here it is only necessary to explain briefly the scope of the analysis and make some general comment on its limitations and significance.

The special analysis for 1919 is confined to 20 industries and even these 20 industries are not completely covered; that is to say, we have included only such establishments in those industries as are located in one or another of the following cities: Boston, Chicago, Cleveland, Detroit, New York, Pittsburgh, San Francisco, and St. Louis. That part of the analysis which presents separate returns by cities includes the 8 cities above mentioned. It was expected in the first place to include the wage earners in the 20 selected industries who were employed in Chicago as well as those in the other cities, but Chicago was inadvertantly omitted from the tabulation of the 20 selected industries. The 10,368 establishments included in the 20 selected

industries constitute, as indicated in Table 114 on page 230, 10 per cent of all the establishments in those 20 industries in the whole of the United States, and the 426,989 wage earners employed in those establishments constituted in 1919, 11 per cent of the wage earners employed in the 20 industries in the whole country. This is a fair sample for all industries combined, but as pointed out in Chapter X, some of the industries are represented by quite inadequate samples and for this reason only 12 of the 20 industries are separately reported. All of the 20, however, are reported in the figures for the group as a whole. It should be added also, that the 20 industries selected for this special analysis included in 1919, in the country as a whole, 42 per cent of the wage earners in all industries.

So far as the cities are concerned, it is believed that the samples are uniformly adequate, the number of wage earners in the 20 industries in the 8 cities constituting 31 per cent of all wage earners in those cities and the number of establishments 21 per cent of all establishments in those 8 cities. Perhaps a more serious limitation upon this special analysis is the fact that it is based upon the very same census items that underlie the main part of our analysis—namely, the amount paid in wages and the average number of wage earners; it is based upon these two items in the same form in which they are utilized in other parts of this monograph—that is to say, in the form of quotients obtained by dividing the wage sum by the average number of wage earners. This quotient, of course, is an average. This average, therefore, constitutes the unit in a series of classified wage tables and in a series of arrays of establishments in the different cities and industries in the order of size of the census average wage quotient. This is another occasion then, and undoubtedly a more serious occasion, where we have been forced to the use of a method which really involves the averaging of averages. And again in this special 1919 analysis this averaging of averages takes the form of setting up medians and decils. The results, of course, do not necessarily indicate the variation between individual wage earners as to the amount of wages received; that is concealed in the establishment average which is the unit of the frequency distributions. What the figures do show directly is the variation between individual establishments in respect to the average wages paid by them. In so far as establishment averages furnish a clue to the level of individual earnings within the plant, we may infer a variation among individual wage earners having some resemblance to the variation among establishments. If there be wide variation among establishments in respect to average wages, we may infer from that a variation at least equally wide among the wage earners represented by the various establishment averages. But this proposition is subject to important qualification. Certainly in any given establishment some of the wage earners

will receive earnings higher than the average—higher, probably, than some of the averages in other plants where average earnings are considerably higher than in the plant where they are employed. The most that can be said is that there is a strong presumption that, in an establishment reporting a high census average wage, a larger proportion of the employees must have received wages around that high average than was likely to have been the case in an establishment reporting a much lower average wage. Yet it is conceivable that an establishment paying a low average wage, might have, concealed in that average, one group of skilled wage earners receiving extraordinarily high earnings, higher even than in the establishment first mentioned, and another group receiving extraordinarily low earnings, lower even than in other establishments where the average wage is lower.

ARRANGEMENT

The following chapters are arranged in six groups, designated as Parts I to VI. So far as possible the discussion of the technique of calculation, method of precedure, etc., has been put in Part V. Part II contains the estimates of absolute *amounts* of per capita earnings; Chapter III dealing with full-time money earnings and with a comparison between full-time and actual money earnings; Chapter IV with actual money earnings (i. e., money earnings reduced in proportion to estimated time lost); Chapter V with actual, "real," earnings (i. e., actual money earnings deflated with a cost of living index); and Chapter VI with a comparison between actual and full-time earnings in respect to purchasing power. *Relative* fluctuations in earnings are discussed in Part III, Chapter VII dealing with changes in full-time earnings, Chapter VIII with changes in actual money earnings, and Chapter IX with changes in the purchasing power of money earnings. Part IV deals with the results of the special inquiry into variability of earnings made on the basis of establishment schedules from the 1919 census. The results for the year 1919 are presented in Chapter X, and in Chapter XI a comparison is made with estimates of variability for the years 1899 and 1904.

Because of limitations in the classifications reported in Census Bulletin 93 it has not been possible to make estimates of *amounts* of earnings for the 14 groups of industries and the 6 industrial divisions, already referred to, nor has it been possible to make approximations of amounts of earnings for the different cities. Amounts are given, however, for each of the 41 selected industries for the different geographic divisions and for certain industries for which earnings are shown separately for 2 of the States in which these industries are most strongly represented. In the case of the 41 selected industries, the amounts are given, not for all sex and age groups combined, but

for men alone, or (in those industries in which an appreciable proportion of women are employed) separately for both men and women. In the other classifications the figures are for all sex and age groups combined.

Changes in earnings are not shown separately for sex and age groups. Since the census does not report separately the amounts of wages paid to different sex and age groups, we seem forced to rely upon the somewhat dubious assumption that the degree and direction of change in earnings is the same for women as for men and probably very nearly the same for children. *Amounts* of average weekly earnings in 1904 are shown separately, however, for men, women, and children in Census Bulletin 93, and it has been possible to make separate estimates of the *amounts* of average earnings of the different sex and age groups. *Relative* per capita earnings (or index numbers) are shown for each of the 41 industries for all sex and age groups combined; for each of the 14 industrial groups and 6 industrial divisions; and for each of a limited number of selected industries for 2 leading States. Index numbers of earnings are also shown for geographic divisions and States, and for the more important cities.

OUTLINE OF PROCEDURE

As was indicated at the outset of this chapter, the estimates of the dollar *amounts* of earnings per capita are subject to a margin of error which is probably much wider than is the case with the index numbers of per capita earnings. The principal source of whatever error may exist in the estimated dollar sums undoubtedly lies in the correction which we have applied to the estimated full-time amounts of earnings in order to take account of unemployment. A less serious source of error, but yet one which, probably, is of some moment, is involved in the rather long and somewhat precarious jump from the amounts of average weekly earnings for different industries and regions, and for men and women, in the week of 1904 covered by the returns of Census Bulletin 93, to the estimated full-time yearly earnings for the same year. The method of making the correction for unemployment is explained in detail in Chapters XV and XVI. The method used in the estimation of amounts of full-time annual money earnings from the weekly averages for 1904 is described in Chapter XIV.

In order to give the setting for the whole problem so that this discussion of the limitations on the data involved in the methods used may be made somewhat clearer, a brief statement of the procedure, as described in detail in Part V, may not be inappropriate. Relative or index numbers of earnings are worked out as follows: [16]

[16] See Appendix II for a sample work sheet illustrative of this procedure.

(1) Index numbers, on the 1914 base, are computed from the census average wage items, which have been derived by dividing wages by wage earners. As explained elsewhere, the census average wage items themselves do not exactly represent average amounts of full-time earnings.[17] The index numbers derived therefrom, however, do appear to reflect very closely *changes* in full-time money earnings, and these index numbers, therefore, are considered to be relatives of *full-time* money earnings, or annual money *rates* of wages. (2) These relatives are then divided by index numbers of the cost of living. The resulting relatives are index numbers of the purchasing power of annual rates of wages. These index numbers, and to a less degree those of full-time money earnings, are of distinctly secondary importance in this study inasmuch as we are dealing primarily with actual rather than full-time earnings. However, some use is made of them as indicating the maximum amounts toward which earnings may climb in years of unusually steady employment. (3) Relatives of actual money earnings are obtained by multiplying the relatives of full-time money earnings by the ratios of actual to full employment. These are indexes which reflect changes in earnings in the proper meaning of that term. (4) These relatives of actual annual earnings per capita are then divided by the index of the cost of living, already mentioned, to obtain index numbers of the purchasing power of actual annual earnings. It will be noticed that none of these steps involves the utilization of data from the special census investigation of average weekly earnings in 1904. Indeed the only outside figures brought into the calculation of relative earnings are the indexes of the cost of living and the data involved in the construction of the ratios of actual full employment.

It seems quite unlikely, aside from the calculation of the employment ratios, that there is any serious source of error involved in this procedure. The possibilities of error in connection with the correction for unemployment probably are not serious, at any rate for all industries combined. For some of the separate industries it undoubtedly involves considerable error, just how much it is not easy to say.

The derivation of estimated *absolute amounts* of earnings is somewhat more intricate. It is impossible at this point to do more than roughly sketch the principal steps involved.[18] The real point of origin is the amount in dollars and cents of average weekly earnings in the busiest week of 1904 (reported in Census Bulletin 93). These amounts are separately reported, of course, for different industries, geographic regions, and sex and age groups. (1) The first step involves the expansion of these average weekly earnings, which are not

[17] See Chap. XIII and Biennial Census of Manufactures, 1923, p. 6.

[18] The procedure is illustrated by a sample work sheet in Appendix I.

full-time earnings but earnings actually received in the busiest week, to estimated full-time weekly earnings.[19] The source and method of construction of this expansion ratio are described in Chapter XIV. (2) The full-time weekly earnings for the specified week of 1904 are next multiplied by the yearly relatives of per capita full-time money earnings already mentioned in connection with the method of calculation of relative earnings. The results show, for each census year and, by interpolation [20] for intercensal years as well, estimated amounts of full-time weekly earnings corresponding to the 1904 estimates. This second operation relies of course upon the validity of the assumption that the relative magnitudes of census average wage amounts for successsive years are closely indicative of changes in per capita full-time earnings.[21] It should be noted additionally that it is assumed, perhaps less justifiably, that these relatives, derived from the census average wage, reflect also changes in the full-time earnings of men and women separately. (3) The estimated amounts of full-time weekly earnings for the different years are then multiplied by 51 and the result in round dollars represents our estimated amounts of full-time yearly money earnings per capita. This full-time annual item is not desired for its own sake, but there has appeared to be no more satisfactory method of arriving at the desired estimates of actual earnings. (4) The fourth step consists in multiplying the full-time items just mentioned by the estimated ratios of actual to full employment, derived as explained in Chapters XV and XVI. The result is the estimated amount of actual annual money earnings per capita. (5) These items of actual money earnings, finally, are divided by the index of the cost of living for the year which they respectively represent, giving as quotients dollar amounts representing the purchasing power at the 1914 price level of the actual annual money earnings per capita. This completes all of the procedure of primary importance, but one further step is taken in order to arrive at the purchasing power of *full-time* yearly earnings. This step, of course, involves no new principle but involves simply the division of full-time yearly earnings by the cost of living index to secure dollar sums representing the purchasing power at the 1914 price level of full-time yearly earnings, or, more briefly, real annual wage rates.

[19] It is taken for granted that earnings in even the busiest week were not full-time earnings. In some industries they came very close to being full-time earnings, and it goes without saying that some wage earners undoubtedly worked full time and more than full time, but it is to be remembered that we are dealing with average earnings of wage earners. Furthermore, in 1904 figures are not invariably for the busiest week; the enumerators were instructed in cases where they could not get earnings for the busiest week to get those averages for a normal or representative week, and it is all the more true, of course, that earnings in a representative week would fall short of full-time earnings. Finally, it is to be remembered that 1904 was a rather poor year in manufacturing industry.

[20] For method of interpolation, see Ch. XIX.

[21] Careful distinction should be made between changes in per capita earnings and per capita changes in earnings; with the latter sort of change we have nothing to do. See Mitchell, W. C., "Methods of presenting statistics of wages," 9 Quarterly Publication, American Statistical Association, pp. 325–343 (Dec. 1905).

The two series of steps which have just been described underlie the great bulk of the analysis herein contained. The procedure involved in Part IV, which deals with the variability of wages, is entirely different and need not be discussed here except to remark that it also has its origin in the census average wage item. In the variability analysis, however, this item is an establishment, not an industry, item. A supplementary bit of construction is involved in the interpolation, for intercensal years, of amounts and relatives corresponding to those just enumerated. This interpolation procedure is described in Chapter XIX.

The estimates of amounts and index numbers of actual yearly earnings, it is highly important to note, are *per capita of all wage earners attached to industry* and not per capita of employed wage earners.[22] An important exception is Table 22, where the figures are per capita of wage earners employed.

MARGINS OF ERROR IN ESTIMATES OF AMOUNTS OF EARNINGS

We now return to the discussion of possible sources of error, particularly in the computation of absolute money amounts of earnings. As already suggested, the step which involved the most serious liability to error is the one involving the multiplication of full-time yearly earnings by estimated fractions of full employment. In attempting to arrive at reliable estimates of the fractions of full employment for the different industries and for all industries combined, two different series of ratios were finally worked out. They are referred to in Chapters XV and XVI as Methods A and B, respectively. As explained in those chapters, the final set of ratios utilized in our analysis estimate is the result of striking an average between the two series. It is believed that this is the most acceptable way out of the difficulty, especially since the methods involved in working out the ratios by Method B are such as to justify the belief that the resulting ratios represent a maximum above which the volume of employment could hardly have gone, and since the results of Method A (because of the method of its construction and because of the assumptions relied upon in working it out) seem to represent minimum points below which employment could hardly have fallen. The arithmetic mean of the two estimates was therefore taken as the one which most closely measured the proportion of full time lost by unemployment, underemployment, sickness, etc. The margin between the final estimate and the maximum and minimum estimates of Methods A and B, respectively, may furnish some clew to the margin of possible error in the final estimated amounts

[22] "Generally speaking, the average number of workers actually employed in an industry is from 3 per cent to 10 per cent less than the numbers of persons attached to the industry." (National Bureau of Economic Research, 2 Income in the United States, 271. See also ibid., p. 39.)

of earnings. For all industries combined, the amount derived through Method A is 9 per cent lower than the amount derived from the ratio finally adopted; the estimate derived from Method B is 9 per cent higher than that derived from the final series of ratios. What this means as to spread between the final estimate and the two extreme estimates is indicated in Table 13 on page 42. For all industries combined, it appears that the true amounts of actual annual money earnings, per capita, in 1899 must have been, in all probability, between $406 and $486; in 1919 between $1,103 and $1,321; in 1923 between $1,198 and $1,436. The table also shows for 14 selected industries the corresponding maximum and minimum amounts and the percentage by which they vary from the final estimates. These 14 selected industries represent pretty completely the range of variation involved in all of our 41 selected industries. No one of the 41 industries has a range of variation greater than 17 per cent, which appears in the agricultural implement industry.[23]

It is evident from the figures of Table 13 that there is a very wide range in the degree of variation as between different industries; thus in printing and publishing, book and job, it would appear that our estimate of the actual amount of money earnings must be much closer to the truth than in the case of tobacco, cigars and cigarettes, and still more in the case of agricultural implements. For the latter industry our final estimate of actual earnings is $1,259 per capita for 1923, the maximum and minimum estimates are $1,473 and $1,045, respectively.

Less important as a source of error than the employment ratios, but not by any means negligible, in all probability, is the first step in the process of estimating absolute amounts of earnings, a step which involves the expansion of the average (actual) weekly earnings in 1904 to estimated full-time weekly earnings for the same week in that year. In the case of this particular part of the process the writer does not know of any way precisely to indicate the degree of error—he does not know what the degree of error is—but there seems to be every justification for the conclusion that it is small compared with the error involved in making correction for unemployment. It certainly can not be great for all industries combined; it may possibly be serious in the case of a few of the individual industries.

The question of the reliability of the relative amounts of earnings shown in Part III is important but is certainly a less serious one than in the case for amounts of earnings. It has been remarked that the relative amounts of the census average items are believed to represent quite accurately changes in per capita full-time earnings; in Table 8 are presented some comparative figures of which it may

[23] The percentage of deviation for each of the 41 selected industries and for each industrial group and division is given in Table 152, p. 337.

TABLE 8.—TEST OF ADEQUACY OF INDEXES OF CENSUS AVERAGE WAGES TO MEASURE CHANGES IN AVERAGE FULL-TIME EARNINGS, EACH YEAR: 1899–1918

[1904=100]

YEAR	U. S. Bureau of Labor Statistics relatives [1]	Indexes of census average wages	YEAR	U. S. Bureau of Labor Statistics relatives [1]	Indexes of census average wages
1899	90.8	89.0	1909	110.4	109.0
1900	93.0	92.2	1910	112.5	110.9
1901	94.0	93.7	1911	114.8	112.4
1902	97.0	96.0	1912	117.7	116.1
1903	99.6	98.3	1913	120.2	120.8
1904	100.0	100.0	1914	122.5	122.0
1905	101.7	102.1	1915	[2] 120.5	124.1
1906	105.3	106.1	1916	128.9	143.4
1907	110.0	110.3	1917	[2] 130.8	166.2
1908	109.4	109.0	1918	167.0	217.8

[1] Average of relatives of 10 industries. See footnote 1 to Table 9.
[2] Average of relatives of 7 industries, since United States Bureau of Labor Statistics did not collect data for "Woolen," "Cotton," and "Boots and shoes" for this year.

be said that while they are not entirely calculated to confirm this belief yet at the same time they do not entirely uproot it. The figures show in parallel columns the United States Bureau of Labor Statistics relatives of full-time weekly earnings, and the indexes which we have used as relatives of full-time (annual) earnings, the figures used in both columns being those for all manufacturing industries. They are not published in this form by the Bureau of Labor Statistics, but were brought together by two writers in the *American Economic Review*.[24] The figures they present have been shifted from the 1890–1899 base to the 1904 base. It will be seen that the two series parallel each other very closely for each year of the period up to the year 1914. In 1915 the difference is somewhat greater and in the following three years it is very considerable. For two of these years, however, it is to be noted that the Bureau of Labor Statistics' indexes are based upon only 7 industries, indeed the whole series of the bureau's indexes rests upon a much smaller industrial basis than the indexes here derived from the census average wage, the number of industries used by the Bureau of Labor Statistics being in no instance more than 10. The industries omitted in 1915 and 1917, moreover, are of major importance. The divergence in the last four years despite these considerations is somewhat disturbing, but it seems fair to conclude that it is not flatly destructive of the structure of the present analysis. Indeed, for the greater part of the period it appears to support it. In Table 9 similar comparisons are made for each of 7 different industries. Here again there are some wide variations between the two sets of figures, but the correspondence seems, on the whole, to be sufficiently close to justify us in using census average wage as we have done.

[24] "The Movement of Real Wages, 1890–1918," by Paul H. Douglas and Frances Lamberson. [*11 American Economic Review*, 409–426 (September, 1921).]

TABLE 9.—TEST OF ADEQUACY OF INDEXES OF CENSUS AVERAGE WAGES TO MEASURE CHANGES IN AVERAGE FULL-TIME EARNINGS, SEVEN SELECTED INDUSTRIES: 1899–1924 [1]

[1904=100]

YEAR	WOOLEN AND WORSTED GOODS ("WOOLEN")		COTTON MANUFACTURES ("COTTON GOODS")		BOOTS AND SHOES	
	U. S. Bureau of Labor Statistics	Census	U. S. Bureau of Labor Statistics	Census	U. S. Bureau of Labor Statistics	Census
1899	91	92	83	94	90	89
1904	100	100	100	100	100	100
1909	112	110	119	115	110	108
1914	126	123	135	127	120	119
1915	----	119	----	123	----	114
1916	145	148	149	143	123	128
1917	----	184	----	172	----	166
1918	236	228	226	246	152	220
1919	----	260	----	270	----	216
1920	386	330	395	330	235	245
1921	----	278	----	262	----	242
1922	293	269	263	249	214	233
1923	----	311	----	289	----	236
1924	332	308	297	280	221	229

YEAR	LUMBER, PLANING-MILL PRODUCTS ("MILLWORK")		FOUNDRY AND MACHINE-SHOP PRODUCTS		PRINTING AND PUBLISHING, BOOK AND JOB		PRINTING AND PUBLISHING, NEWSPAPERS AND PERIODICALS	
	U. S. Bureau of Labor Statistics	Census	U. S. Bureau of Labor Statistics	Census	U. S. Bureau of Labor Statistics	Census	U. S. Bureau of Labor Statistics	Census
1899	91	85	91	91	91	89	95	86
1904	100	100	100	100	100	100	100	100
1909	107	110	109	110	110	110	109	110
1914	116	124	121	118	122	124	118	125

[1] U. S. Bureau of Labor Statistics indexes 1899 to 1918 are from Douglas and Lamberson, "Movement of real wages, 1890–1918," 11 American Economic Review, 417 (September, 1921), the 1890–1899 base used by Douglas and Lamberson being shifted to 1904; after 1918 from various bulletins of the U. S. Bureau of Labor Statistics, where the figures are generally on the 1913 base.

The assertion has been made in reference to the relatives derived from the census average wage [25] items that these relatives reflect with equal reliability the wages of different sex and age groups. This is largely guesswork. Yet there is some evidence which appears to give it sufficient confirmation to justify its provisional acceptance. The confirmatory data referred to are presented in Table 10. They are the index numbers of average weekly earnings for classified groups of labor for 23 industries combined, published by the National Industrial Conference Board.

The table shows in parallel columns the index numbers of average weekly earnings of skilled and unskilled male workers and of female workers, irrespective of skill, for certain months of the period since 1914. It is true that the board's figure is for average actual weekly earnings; that is to say, they are not full-time weekly earnings. Yet

[25] See initial paragraph, Chap. XIII, p. 269.

the presumption is a fair one that if the actual weekly earnings of men and women fluctuate fairly closely together, the full-time earnings also will fluctuate together. Moreover, average weekly earnings much more closely approximate full-time weekly earnings than average yearly earnings approximate full-time yearly earnings. In other words, the shorter the time period for which actual earnings are reported, the more closely do those earnings approximate full-time earnings. The relatives in the table, despite appreciable differences, evidence a fairly close correspondence between changes in men's earnings and changes in women's earnings.

TABLE 10.—INDEX NUMBERS OF AVERAGE WEEKLY EARNINGS FOR COMPOSITE AND CLASSIFIED GROUPS OF LABOR; 23 INDUSTRIES [1]

	MEN		Women		MEN		Women
	Unskilled	Skilled			Unskilled	Skilled	
1914—July	100	100	100	1923—January	197	201	214
				February	198	202	214
1920—June	256	239	243	March	201	208	218
December	239	223	218	April	211	215	222
1921—January	220	208	205	May	217	220	231
March	202	194	206	June	216	218	229
May	193	186	208	July	215	216	222
August	182	183	204	August	215	214	226
October	183	182	205				
December	179	182	204	September	216	215	226
				October	218	217	225
1922—July	184	185	196	November	214	216	225
August	185	190	195	December	214	214	220
September	190	192	202				
October	195	197	207	1924—January	215	215	222
November	196	199	211				
December	199	201	213				

[1] Reprinted by permission from Wages, Hours, and Employment in American Manufacturing Industries, July, 1914-January, 1924 (Research Report No. 69. New York: National Industrial Conference Board, p. 15).

There is available in the census reports only the scantiest of material that can be made to throw light upon the parallelism here assumed to exist between the income fluctuations of male and female wage earners, respectively; there is nothing at all available there subsequent to the 1905 census of manufactures. In 1890, 1899, and 1904 the Census Bureau reported the amounts paid in wages to each sex and age group separately; since 1905 it has reported only the single item of amount of wages paid to male, female, and child wage earners lumped together. In the census years when the wage payment item was subdivided the percentages of change in average yearly earnings for the two intervals spanned were as follows, for all industries combined:

SEX AND AGE GROUP	PERCENTAGES OF CHANGE	
	1890–1899	1899–1904
Men	−1.6	+9
Women	+2.0	+9
Children	+10.0	+15

Examination of corresponding figures for separate industries makes it quite certain that there are appreciable differences between the sex and age groups in respect to the direction and degree of change in average earnings. This situation is not calculated to give any material support to the assumption that has been made of parallel series of fluctuations in the earnings of men and women. It produces, indeed, a serious imperfection in the present analysis in so far as it attempts to set forth, separately, the earnings of women and of children.

Yet there is evidence that the ratio of the average earnings of male workers to the average earnings of female workers is likely to remain fairly constant over considerable periods. The special census investigation of 1904 showed that, for all manufacturing industries combined, the ratio of men's average weekly earnings to women's was for that year, 1.8. The National Bureau of Economic Research reports that "a survey of a number of industries for which data are available for more recent years indicates that the ratio of the earnings of males to those of females, in the case of wage earners at least, has not changed materially since 1905." [26] It may well be, therefore, that for any period within which the proportions of the work force made up of men and women, respectively, do not materially change, the ratio of men's earnings to women's will remain practically constant. To the degree that this is true changes in men's earnings will reflect changes in women's earnings, or changes in the earnings of mixed groups will reflect changes in the earnings of either sex.

In reporting changes in average earnings it is extremely important to be assured of the homogeneous character of the group for which changes are reported. Failing this assurance, it is imperative, if the group be not homogeneous, that that fact should have proper consideration in the interpretation of the results. The misleading possibilities of a change in the proportions of women and of children or of highly skilled wage earners between one year and another have been mentioned. It is particularly necessary in the circumstances of the present analysis to be cognizant of any changes in its composition that may have affected the homogeneity of the wage-earning group. It is, of course, important to earmark those industries where there has been no marked change in the composition of the body of workers. This is particularly desirable because of the fact that it is impossible to report actual earnings received by individual wage earners in those sorts of groups which are ideally calculated to reveal earnings of definite kinds of labor—namely, *occupational* groups. Since we have to deal with industrial groups which merge all sorts of occupations, degrees of skill, different sexes and ages, and since in addition to all

[26] Income in the Various States, p. 79.

this we are obliged to depend upon averages, it is of prime importance that we have before us whatever may be available to throw light upon this question of homogeneity.

In Part VI there appear two tables which are designed to supply some of this necessary information. Table F indicates the proportions for the years 1910 and 1920 of skilled, semiskilled, and unskilled workers, respectively, who were employed in the different industries listed. It is possible from this table to ascertain whether or not, in the case of any particular industry (unfortunately data are not available for all of our selected industries), there has been a change in the proportion of skilled, unskilled, or semiskilled workers. An examination of the table indicates that in a number of industries there have been rather considerable changes in respect to the proportions of employees of different degrees of skill. These figures are but rough approximations, since the percentages were calculated by means of a somewhat anomalous process of division. The numbers of skilled, semiskilled, and unskilled workers were taken from the decennial census of occupations, and the total number of wage earners in the different groups were taken from the manufactures census. The result is that at best the figures are fragmentary and only roughly indicative of the changes which have taken place. In later discussions of the results for different industries, the writer has attempted adequately to take into consideration such changes as appear to be indicated by the figures of Table F and comments are made in connection with different industries where they seem to be called for.

In Table G are given similar comparative percentages of the proportions of women and children employed in each of the selected industries for each manufactures census year since 1899. It appears that so far as sex and age groups are concerned there has been little change in the character of the work force during the period with which we are dealing. For all industries combined all the way through the period from 1899 to 1919, inclusive, the proportion of women has been 20 per cent; the proportion of children has altered slightly, starting with 3 per cent in 1899 and dropping to 1 per cent in 1919. This change, however, is not sufficient materially to affect our results. In the individual industries, there are for the most part not enough sizable shifts in the proportions to cause any trouble whatever. Yet in certain cases our results should be discounted in view of the changes in proportions shown. For example, in tobacco, cigars and cigarettes, the proportion of women increased between 1899 and 1919 from 37 per cent to 58 per cent. In the per capita earnings shown in later pages for that industry there seems to have been a particularly heavy fall between 1899 and 1923. Assuming that the work force in the industry remained uniform in its character throughout the period, we would say that there has been considerable

drop in per capita earnings in that industry. But has this really been the case? The introduction of a considerably larger proportion of women will of course reduce the per capita average for the industry. It is shown in the series of index numbers of real earnings for all industries combined, by sex and age groups, that the average money earnings for women were $627 in 1921, whereas the corresponding figure for men is $1,170. Coming closer home, in the tobacco industry itself our estimates of amounts of money earnings per capita in that year are $898 for men and only $499 for women. The earnings of women have probably fallen in that industry, so also perhaps have those of men, but have the earnings he gets fallen as rapidly as would appear from the figures shown in Part III? Probably not. In men's clothing there is an appreciable change in the proportion of women, although it is not as great as in the case of tobacco; in this case the change is in the opposite direction, however. We should expect it to show, as a result, an increase in earnings in that industry greater than the increases which actually have taken place. The results of the present analysis do show for the men's clothing industry somewhat more rapid increase in earnings than has prevailed for all industries combined, and a part of this gain is no doubt a fictitious result of the diminished proportion of women employed in the industry. The only other industries which indicate that there have been shifts in sex proportions of disturbing size are the dyeing and finishing of textiles, the manufacture of paper and wood pulp, and of glass.

Still another important factor which affects wages is the extent of union organization. The figures of course are not made fictitious because of the fact that a certain definite group of wage earners performing certain definite kinds of work is organized into a union. That may have the effect of raising their wages and that increase ought to be reflected in our figures. The results are made spurious when the change is something more than a change from unorganized to organized status. The kind of change that makes our results misleading is the double change involved in unionizing a factory by substituting for unskilled, unorganized workers, skilled, organized ones. Now, very often increases in the proportion of organized workers really involve increases in the proportion of those who are skilled. The organization of a factory may introduce more highly skilled workers, so that figures indicating proportions organized in different industries in successive years furnish important clews to changes in the composition of the body of wage earners. What scattered figures seem to be available in regard to the proportion of wage earners organized are presented in Table 11. The percentages are obtained by dividing Mr. G. E. Barnett's figures for the number of trade-unionists in different industries in census years, by the number of wage earners in those industries. It is clear that in a few industries,

notably women's clothing, boots and shoes, leather, electric-railroad repair shops, and electrical machinery, there have been considerable increases in the proportions of organized wage earners. Contrariwise, there seem to have been declines in these proportions in the furniture industry. In the others for which we have data, there appears to have been no very large change. Figures indicate a considerable increase in the iron and steel industry, but it is doubtful whether the increase is as great as is indicated in the table. In Table 12 a comparison is made between 1910 and 1920 in respect to the degree of organization in the various industries. The figures confirm in a general way the analogous data of Table 11.

TABLE 11.—APPROXIMATE PROPORTIONS OF UNION WAGE EARNERS IN THE SELECTED INDUSTRIES, CENSUS YEARS:[1] 1899–1919

INDUSTRY	PER CENT OF THE WAGE EARNERS IN THE INDUSTRY WHO WERE ORGANIZED IN—				
	1899	1904	1909	1914	1919
Bread and other bakery products		20	11	13	15
Flour-mill and gristmill products		5	2		
Liquors, malt	22	52	67	87	77
Mineral and soda waters					
Clothing, women's	5	41	36	77	82
Boots and shoes, not including rubber boots and shoes	3	21	17	28	36
Leather, tanned, curried, and finished	2	12	8	3	9
Furniture	15	39	10	4	6
Lumber and timber products					
Lumber, planing-mill products, not including planing mills connected with sawmills				3	1
Paper and wood pulp		20	3	9	12
Printing and publishing, book and job	26	42	37	45	55
Printing and publishing, newspapers and periodicals					
Petroleum refining		2			8
Glass	21	26	39	37	30
Iron and steel, blast furnaces	7	16	8	8	25
Iron and steel, steel works and rolling mills					
Foundry and machine-shop products				47	92
Cars, steam-railroad	1	10	6	9	18
Railroad repair shops—electric					
Railroad repair shops—steam					
Electrical machinery, apparatus, and supplies	5	35	16	26	62

[1] Adapted from Barnett, G. E., 30 Quarterly Journal of Economics, 838, and 12 American Economic Review, 52 (March, 1922, supplement), "Growth of labor organization in the United States."

The question of how far these changes in organization have meant changes in the character of labor—that is to say, in how far they have meant the infusion of skilled and more highly paid labor into a lower-paid group—is difficult to answer and the best we can do, perhaps, is simply to call attention to the fact that here at least are facts of record which ought to be taken into consideration in interpreting those results.

THE SIGNIFICANCE OF THE AVERAGES

In order to provide some means for evaluating the industry averages reported in the following pages, and to make as clearly evident as possible the large amount of variation between industries and still more as between establishments within the different industries, and

TABLE 12.—PERCENTAGE OF WAGE EARNERS ORGANIZED IN 1910 AND 1920,[1] BY INDUSTRY GROUPS

INDUSTRY	1910		1920	
	Male	Female	Male	Female
Bread and other bakery products	19.6		24.7	
Flour-mill and gristmill products	.8		2.1	
Slaughtering and meat packing, wholesale	6.7		59.7	42.6
Slaughtering, wholesale, not including meat packing				
Liquors, malt	69.1	24.4		21.5
Mineral and soda waters				
Tobacco, cigars and cigarettes	42.4	8.0	47.7	13.5
Clothing, men's	21.9	11.2	76.6	46.0
Clothing, women's				
Cotton manufactures	4.8	2.6	8.3	11.5
Dyeing and finishing textiles, exclusive of that done in textile mills				
Knit goods				
Silk goods				
Woolen goods				
Worsted goods				
Carpets and rugs				
Boots and shoes, not including rubber boots and shoes	24.4	8.9	32.1	44.6
Leather, tanned, curried, and finished	5.4	.3	12.1	28.6
Furniture	10.5	2.1	19.1	
Lumber and timber products				
Lumber, planing-mill products, not including planing mills connected with sawmills				
Paper and wood pulp	3.5	.8	10.3	1.3
Printing and publishing, book and job	39.8	11.6	55.4	25.0
Printing and publishing, newspapers and periodicals				
Chemicals (and allied industries)	1.5		.2	
Glass	36.4		31.6	
Brick and tile, terra-cotta, and fire-clay products	3.9		9.1	
Pottery	26.7		28.2	
Iron and steel, blast furnaces	10.5		28.7	
Iron and steel, steel works and rolling mills				
Smelting and refining, copper, lead, and zinc (metals, except iron and steel)	7.3		15.6	
Rubber tires, tubes, and rubber goods, not elsewhere specified	.1			

[1] Percentages from Appendix Tables VI and VII, in Growth of American Trade Unions, 1880 to 1923. New York: National Bureau of Economic Research, 1924.

finally, by implication, the variation in earnings as between individual wage earners, which is undoubtedly no less than the variation between establishments, three charts are introduced at this point. Figure 1 [27] shows the 41 selected industries arrayed in the order of increasing per capita money earnings in the year 1919, in the United States as a whole. The width of each bar is made proportionate to the average number of wage earners employed in 1919 in the industry which the bar represents. The estimate of per capita yearly earnings for the United States as a whole and for all industries combined for the year 1919 is $1,212. This sum is based upon all manufacturing industries covered by the census. It is not an average of the averages for our 41 selected industries. It will be seen from the chart that the median industry shows a per capita money earnings sum of $1,223, slightly higher than the sum derived from the whole of manufacturing industry, reflecting, as already pointed out, the fact that our 41 selected industries probably represent higher earnings than the more than 300 other relatively small and unimportant industries not sepa-

[27] Drawn from the data of Table 38, on p. 96, and Table K, on p. 408.

rately reported in this book. The median industry shown in the chart, an industry having a per capita earnings figure of $1,223, happens to be the one described by the census as "Leather, tanned, curried, and finished." The chart makes it very evident that there are large and important industries in which the per capita money earnings received in 1919 were vastly lower than the per capita amount for all industries combined. It also makes it equally clear that there are other large and important industries in which the per capita earnings were higher by wide margins than they were for the median industry, or even for a number of smaller industries near the median. For example, down among the low industry averages are the lumber and timber products industry, employing, in 1919, 5.29 per cent of all manufacturing wage earners, and the cotton manufacturing industry employing in the same year 4.91 per cent of all manufacturing wage earners. Among the higher industry averages are steam-railroad repair shops, employing 5.33 per cent of all manufacturing wage earners, and foundry and machine-shop products, employing 5.31 per cent of all manufacturing wage earners. The lowest per capita earnings in 1919 appear to have been received in the mineral and soda water industry, where the average per capita earnings were $866 a year. The maximum industry is the blast-furnace division of the iron and steel industry, where per capita earnings for 1919 were $1,777.

It has been remarked that there must necessarily be within each of these industries, although in each in a varying degree, wide differences between establishments as to per capita earnings received in them, in addition to wide fluctuations within the establishments among individual wage earners.[28] As an example of what is concealed by the per capita sums represented by the bars of Figure 1 the automobile industry is used, and in Figure 2 are shown the per capita amounts of money earnings for each of the 59 automobile manufacturing establishments which happen to be included in the special study of variability reported in Chapters X and XI. The chart is drawn from the data of Table 169. It should be remarked that the 59 establishments represented in this chart constitute 19 per cent of the automobile establishments in the United States and that the wage earners employed in the 59 establishments make up 22 per cent of all wage earners in the automobile industry in the United States. The bars are constructed on the same principle as are those of Figure 1. The width of the bars is proportionate to the average number of wage earners employed in the establishment which the bar represents. For each establishment the length of the bar represents the estimated

[28] For example, the earnings of unskilled factory workers (of whom there are at least a few in almost all factories, and considerable numbers in many factories) are much lower than those of their skilled fellow workers. Cf. article on Low Earnings of Unskilled Labor in the United States in 25 Monthly Labor Review, 225–7 (August, 1927).

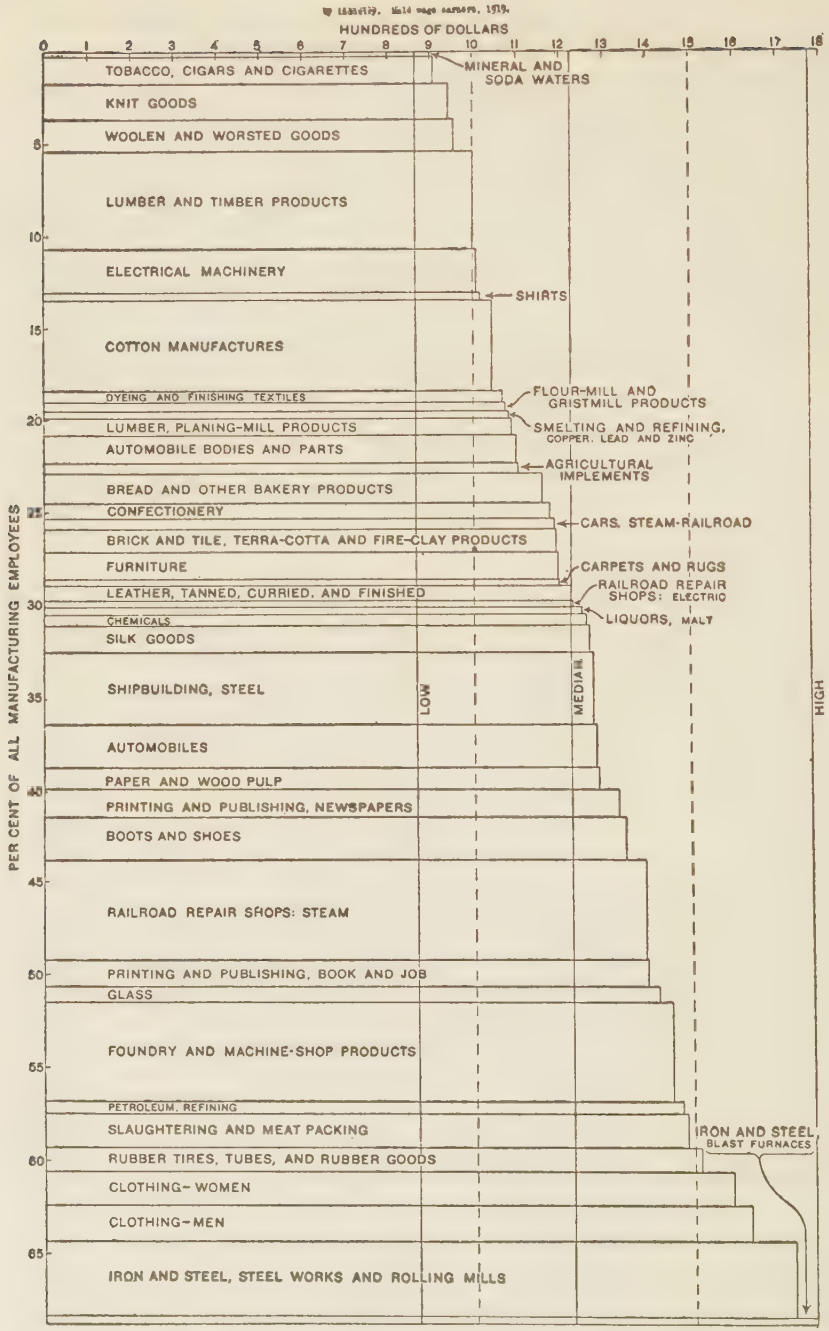


FIG. 1.—SIZE OF WORK FORCE AND AMOUNTS OF ACTUAL MONEY EARNINGS, PER CAPITA, BY INDUSTRY—MALE WAGE EARNERS: 1919

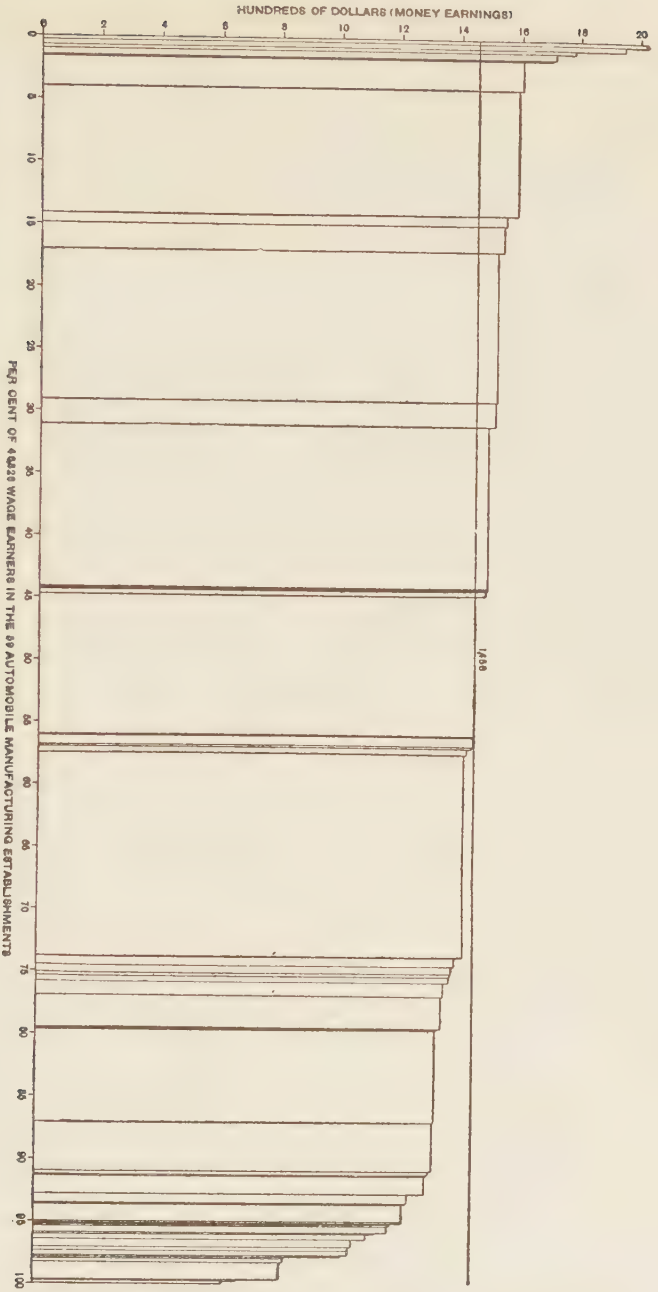


FIG. 2.—AVERAGE EARNINGS AND SIZE OF WORK FORCE IN 59 AUTOMOBILE ESTABLISHMENTS: 1919

annual money earnings per capita received by its employees in the year 1919. This estimated average is worked out from the census average wage as a starting point, following the procedure described in Chapter XX. The automobile industry is one in which the degree of variation of earnings is unusually slight; that is to say, in this industry there is a pronounced tendency for the bulk of the establishments, especially the large establishments, to pay the same yearly amounts of wages that are paid in the median establishment. The relative position of the automobile industry as compared with other industries in respect to variation in earnings may be ascertained by inspection of Figure 1. Its position is fixed more exactly in Table 122, where it is shown that the standard deviation of earnings from average earnings in the automobile industry is $170, as compared with $427 for 20 important industries combined, and that the coefficient of variation for the automobile industry is 11.7 per cent as compared with 33.6 per cent for the 20 industries combined. Bearing in mind this relatively higher degree of uniformity of earnings in the automobile industry as compared with other industries, it will be easy to appreciate the tremendous range of variation which must be concealed by the industry averages of Figure 1. Even in this industry of relatively uniform earnings, there are a number of establishments, relatively small it is true, in which the per capita earnings received range from $635 to $1,200 per year; and a smaller group (also of relatively small establishments) in which the per capita earnings received range from $1,700 to $2,262 a year. The average for the 59 firms is $1,016. We can infer then what must be the extent of variation in such industries as women's clothing and newspaper printing and publishing, where the coefficients of variation are 44 per cent and 83 per cent, respectively.

A more adequate idea of this range of variation between establishments may be had from Figure 3 (based on Table 117), which shows in the form of a somewhat rough approximation the range of variation in respect to per capita earnings in individual establishments within 11 of the industries covered in the special inquiry into variability. The point from which the lines diverge at the top of the chart represents the amount of money earnings per capita in 1919 for all manufacturing industries combined—the amount being $1,212. The amounts are measured from the left along the scale of money earnings per capita, at the top of the chart. The 11 perpendicular lines below the point representing the median industry are connected to that point by diagonal lines and represent by their distance from the left side of the chart, the per capita money earnings received in each of the 11 industries shown in the chart. In order to prevent the spread within each industry blurring the corresponding spreads within the other industries, each of the 11 lines is dropped

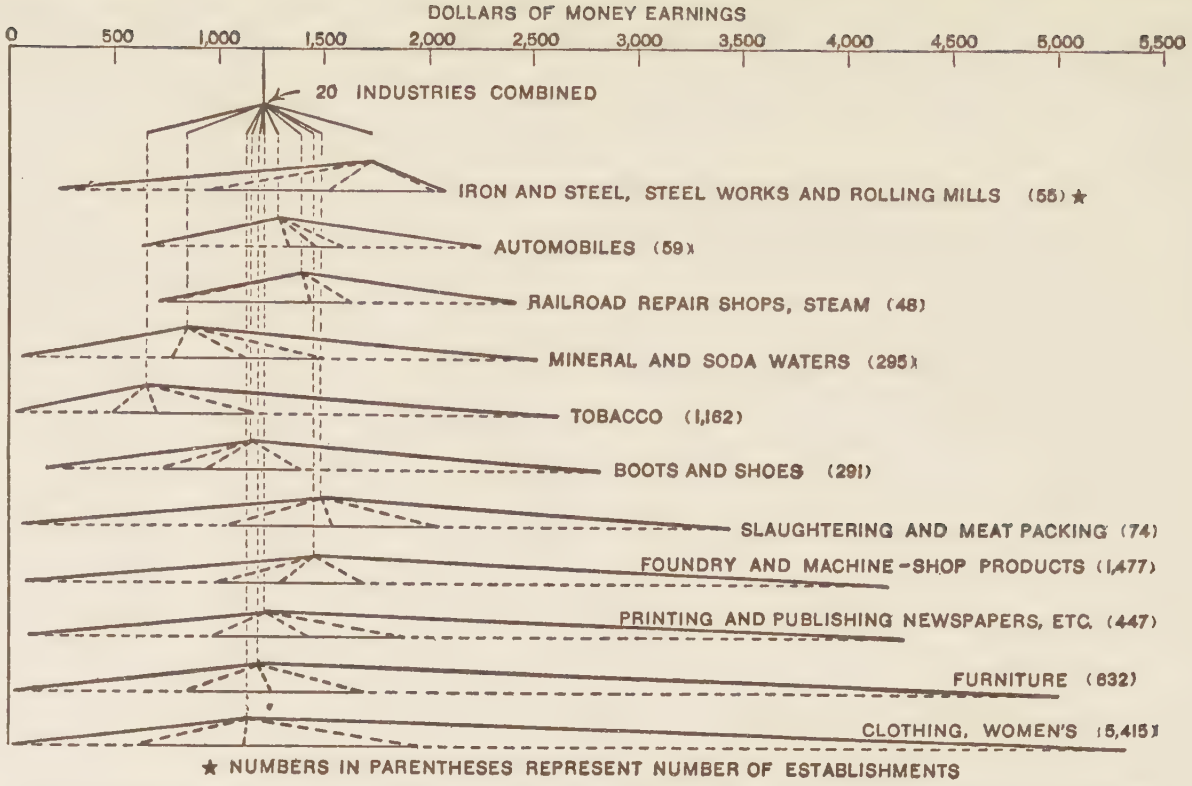


FIG. 8.—RANGE OF ESTABLISHMENT AVERAGES OF PER CAPITA MONEY EARNINGS IN CERTAIN SELECTED INDUSTRIES: 1919

down a space below the industry represented by the line to the left. From the ends of each of these descending industry lines radiate diagonal lines drawn to the scale at the top of the chart to indicate the range in earnings between establishments where wage earners received the lowest per capita earnings in the particular industry, and the establishments where the highest per capita earnings were paid. For example, in the case of the mineral and soda water industry, in that 1 of the 295 establishments reported for the industry in which per capita earnings were lowest, those earnings were $59 a year. In that 1 of the 295 establishments in which the per capita earnings received were highest, those earnings were $2,515 per year. Corresponding ranges in other industries from lowest establishment to highest establishment are from $172 to $2,825 in boots and shoes; $229 to $2,079 in iron and steel, steel works; and from $715 to $2,419 in steam-railroad repair shops. Obviously, these extreme items are not only unrepresentative cases; they are to a certain extent spurious cases, representing perhaps establishments having only one or two employees, and in operation for, possibly, only a week or two during the year. These extreme cases really should be ignored. The lowest and highest tenths are, therefore, segregated on the chart by diagonal lines drawn in such a way as to include within their arc all establishment averages between the upper one-tenth or the lower one-tenth of the establishments represented. We have taken, in other words, the per capita earnings received in that establishment which marks off the highest one-tenth of all establishments reporting their per capita earnings, and at the other end of the scale the establishment which marks off the lowest one-tenth of all the establishments, or in statistical terminology, we have indicated the first and ninth decils of per capita money earnings for each industry. It is evident that the throwing out of the upper and lower tenths eliminates, in the case of nearly all of our 11 industries, all or nearly all of the extreme and wildly unrepresentative items. Thus, in mineral and soda waters, instead of the range between the high and low establishment averages, which runs from $59 to $2,515, we have the range between the first and ninth decils, which runs from $777 to $1,499. Now this range, it is to be remembered, includes eight-tenths of the 295 establishments in this industry. The lower end of the middle diagonal dotted line in the case of each industry spread represents the per capita earnings of the median plant of the 295 plants in the industry for which we have worked out separate establishment figures. The upper end of this same line represents, by its distance from the zero line at the left, the mean earnings, per capita, for all of the establishments in this industry throughout the country. The per capita amounts of earnings in every case are of course represented by the distance from the ends of the diagonal lines to the base line at the left of the chart.

We may get also from this chart a confirmation of what has been said about the relative degree of uniformity in the automobile industry as compared with other industries. While the range from the lowest establishment to the very highest in the automobile industry is $628 to $2,240, most of this range is taken up by those extreme cases which are distinctly unrepresentative. Eight-tenths of the factories in the automobile industry evidently employ wage earners whose per capita earnings range between $1,326 and $1,590.[29] Figures in parenthesis opposite the names of industries indicate the number of establishments included in the data from which the chart is made.

It is noteworthy that in spite of these very wide fluctuations among the different industries in respect to the amounts of earnings in separate establishments within them,[30] the results of the special inquiry into variability of earnings (as shown by establishment averages in 1919) demonstrate that the averages for the different industries as a whole are pretty faithfully representative of the style in wages in the different establishments. Our average for all industries combined, based on all industries covered by the census, is $1,212 per capita; money earnings in the median industry are $1,223 per capita. The median establishments within separate industries show high degrees of correspondence and give us a good deal more confidence in the averages which are derived from the census average wage items. Not only the fair degree of correspondence, shown in Table 16, p. 47, between the medians of the special inquiry for 1919 and the estimated averages based upon the whole of the census returns, but also the tendency toward concentration around the median, illustrated in Figure 3, unite to give us greater confidence in our results. Possibly we can say still more: if the fluctuations among individual wage earners in a given establishment are not greater, and it is not believed that they generally are greater, than the range of variation of establishments within the industries, we shall have more reason to accept our industry averages as reasonably close indicators of the typical earnings actually received by individual wage earners.[31] It seems quite reasonable to conclude that,

[29] These figures are undoubtedly high for the automobile industry, since the average in the main part of this analysis derived from the whole automobile industry is $1,278. The higher earnings shown for the establishments in the 8 large cities covered in the special variability inquiry are probably the result of the higher wages generally prevailing in larger cities and possibly also in some measure the result of inadquate size of samples.

[30] Fluctuations so wide that in some low-wage industries like mineral and soda waters, and tobacco, there is a considerable proportion of establishments in which average earnings are higher than the average earnings in several other industries which rank in respect to per capita earnings much higher than either of the two industries mentioned.

[31] The ranges shown in the voluminous classified wage tables in Mr. Davis R. Dewey's census report on Employees and Wages, published in 1904, reveal very wide variations both in weekly rates and weekly earnings, but those ranges do not seem to exceed the ranges among establishments, which we have illustrated in fig. 3, and the range in variation in respect to earnings does not seem to be any wider than that in respect to rates. If Mr. Dewey's data had been for yearly earnings, it is probable that the range of variation would be considerably greater for earnings than for rates, but being on a weekly basis, it is not surprising that there are no greater differences between the ranges shown for rates and earnings, respectively.

to the degree that any given industry average is fairly reflective of the wages paid in different establishments, it will be reflective of the wages received by the greater part of the wage earners within those establishments, if there is no greater fluctuation among wage earners in relation to the establishment than in establishments in relation to the industry.

TABLE 13.—HIGH, LOW, AND FINAL ESTIMATES OF MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, FOR CERTAIN SELECTED INDUSTRIES, CENSUS YEARS: 1899–1923 [1]

[Male wage earners only, except for "all industries," where all sex and age groups are included]

INDUSTRY	Method used to compute fraction of full employment	Estimate	1899	1904	1909	1914	1919	1921	1923
All industries	B	Max. 9% higher	$486	$526	$607	$628	$1,321	$1,141	$1,436
	Average	Final	446	483	557	576	1,212	1,047	1,317
	A	Min. 9% lower	406	440	507	524	1,100	953	1,198
Bread and other bakery products.	B	Max. 3% higher	443	564	634	609	1,192	1,302	1,327
	Average	Final	430	548	616	591	1,157	1,264	1,282
	A	Min. 3% lower	417	532	598	573	1,122	1,226	1,250
Slaughtering and meat packing.	B	Max. 7% higher	525	615	632	656	1,588	1,367	1,550
	Average	Final	491	575	591	613	1,484	1,278	1,451
	A	Min. 7% lower	457	535	550	570	1,380	1,189	1,348
Tobacco, cigars and cigarettes	B	Max. 10% higher	485	515	527	582	998	988	1,042
	Average	Final	441	468	479	529	907	898	947
	A	Min. 10% lower	397	421	431	476	816	808	852
Clothing, men's	A	Max. 2% higher	566	618	730	758	1,656	1,717	1,894
	Average	Final	555	606	716	743	1,624	1,683	1,857
	B	Min. 2% lower	544	594	702	728	1,592	1,649	1,820
Leather, tanned, curried, and finished.	A	Max. 6% higher	453	480	553	564	1,296	1,105	1,601
	Average	Final	427	453	522	532	1,223	1,042	1,510
	B	Min. 6% lower	401	426	491	500	1,150	979	1,419
Lumber and planing-mill products, not including planing mills connected with sawmills.	B	Max. 3% higher	462	541	608	643	1,121	1,200	1,562
	Average	Final	449	525	590	624	1,088	1,165	1,517
	A	Min. 3% lower	436	509	572	605	1,055	1,130	1,471
Printing and publishing, book and job.	A	Max. 1% higher	593	645	746	788	1,412	1,789	2,032
	Average	Final	587	639	739	780	1,398	1,771	2,012
	B	Min. 1% lower	581	633	732	772	1,384	1,753	1,992
Petroleum refining	A	Max. 7% higher	703	627	718	803	1,576	1,433	1,718
	Average	Final	657	586	671	750	1,473	1,339	1,606
	B	Min. 7% lower	611	545	624	698	1,370	1,245	1,494
Glass	A	Max. 3% higher	654	716	656	826	1,463	1,381	1,714
	Average	Final	635	695	637	802	1,420	1,341	1,664
	B	Min. 3% lower	616	674	618	778	1,377	1,301	1,614
Iron and steel, steel works and rolling mills.	B	Max. 13% higher	644	633	802	760	1,953	1,162	2,072
	Average	Final	570	560	710	673	1,728	1,028	1,834
	A	Min. 13% lower	496	487	618	586	1,503	894	1,596
Smelting and refining, copper, lead, and zinc.	B	Max. 8% higher	550	622	665	669	1,171	801	1,344
	Average	Final	509	576	616	619	1,084	742	1,244
	A	Min. 8% lower	468	530	567	569	997	683	1,144
Automobiles	B	Max. 4% higher	529	518	606	766	1,329	1,017	1,657
	Average	Final	509	498	583	737	1,278	978	1,593
	A	Min. 4% lower	489	478	560	708	1,227	939	1,529
Railroad repair shops, steam	B	Max. 10% higher	585	613	716	705	1,533	1,285	1,753
	Average	Final	532	557	651	641	1,394	1,168	1,594
	A	Min. 10% lower	479	501	586	577	1,255	1,051	1,435
Agricultural implements	B	Max. 17% higher	483	508	605	686	1,288	1,161	1,473
	Average	Final	413	434	517	586	1,101	992	1,259
	A	Min. 17% lower	343	360	429	486	914	823	1,045

[1] See also Table 34, in which corresponding high, low, and final estimates are shown for intercensal years.

TABLE 14.—RATIOS SHOWING, FOR 1904 AND 1919, THE REPRESENTATIVENESS OF THE ESTABLISHMENTS SPECIALLY REPORTED FOR WEEKLY EARNINGS IN 1904, WITH NUMBER AND PERCENTAGE DISTRIBUTION IN 1899 AND 1919 OF WAGE EARNERS IN THE 41 SELECTED INDUSTRIES

SELECTED INDUSTRY	PERCENTAGES BORNE BY THE NUMBER OF WAGE EARNERS EMPLOYED IN SELECTED ESTABLISHMENTS, IN SPECIFIED WEEK[1] OF 1904, TO—		AGGREGATE AVERAGE NUMBER OF WAGE EARNERS		PERCENTAGES OF ALL MANUFACTURING WAGE EARNERS	
	The greatest number employed at any one time in all establishments in— 1904[1] A	The average number in all establishments in— 1919 B	1899 C	1919 D	1899 E	1919 F
All industries	47	36	4,712,763	9,096,372	100.00	100.00
Forty-one selected industries	.....	.....	3,337,685	6,210,033	70.82	68.27
Bread and other bakery products	65	42	80,192	141,592	1.28	1.56
Flour-mill and gristmill products	64	68	32,226	45,481	.68	.50
Confectionery	[2] 43	21	[3] 26,866	76,493	[3] .57	.84
Slaughtering and meat packing	40	22	68,386	160,996	1.45	1.78
Liquors, malt	52	83	39,459	34,259	.84	.38
Mineral and soda waters	65	55	8,788	17,440	.19	.19
Tobacco, cigars and cigarettes	51	61	103,365	138,773	2.19	1.53
Carpets and rugs, other than rag	29	35	28,411	22,933	.60	.25
Shirts	39	42	36,622	39,603	.78	.44
Clothing, men's	30	27	120,927	175,270	2.57	1.93
Clothing, women's	27	24	83,739	165,649	1.78	1.82
Cotton manufactures	[4] 58	47	302,861	446,852	6.42	4.91
Dyeing and finishing textiles, exclusive of that done in textile mills	51	36	29,776	55,985	.63	.62
Knit goods	39	26	83,691	172,572	1.78	1.90
Silk goods, including throwsters	34	24	65,416	126,782	1.39	1.39
Woolen and worsted goods	63	54	125,901	166,787	2.67	1.83
Boots and shoes, not including rubber boots and shoes	53	44	141,830	211,049	3.01	2.32
Leather, tanned, curried, and finished	59	56	52,109	72,476	1.11	.80
Furniture	44	41	87,262	138,331	1.85	1.52
Lumber and timber products	28	37	413,257	480,945	8.77	5.29
Lumber, planing-mill products, not including planing mills connected with sawmills	42	58	73,510	86,956	1.56	.96
Paper and wood pulp	51	34	49,646	113,759	1.05	1.25
Printing and publishing, book and job	50	43	67,610	123,005	1.43	1.35
Printing and publishing, newspapers and periodicals	58	54	94,604	120,381	2.01	1.32
Chemicals	51	21	15,163	55,586	.32	.61
Petroleum refining	78	26	12,199	58,889	.26	.65
Brick and tile, terra-cotta, and fireclay products	37	63	105,693	104,849	2.24	1.15
Glass	42	48	52,818	77,520	1.12	.85

[1] Namely, week for which earnings are reported in Census Bull. 93.
[2] Census Bull. 93, pp. 17, 98.
[3] "Confectionery and ice cream."
[4] "Cotton goods."

TABLE 14.—RATIOS SHOWING, FOR 1904 AND 1919, THE REPRESENTATIVENESS OF THE ESTABLISHMENTS SPECIALLY REPORTED FOR WEEKLY EARNINGS IN 1904, WITH NUMBER AND PERCENTAGE DISTRIBUTION IN 1899 AND 1919 OF WAGE EARNERS IN THE 41 SELECTED INDUSTRIES—Continued

SELECTED INDUSTRY	PERCENTAGES BORNE BY THE NUMBER OF WAGE EARNERS EMPLOYED IN SELECTED ESTABLISHMENTS, IN SPECIFIED WEEK OF 1904, TO—		AGGREGATE AVERAGE NUMBER OF WAGE EARNERS		PERCENTAGES OF ALL MANUFACTURING WAGE EARNERS	
	The greatest number employed at any one time in all establishments in— 1904 A	The average number in all establishments in— 1919 B	1899 C	1919 D	1899 E	1919 F
Iron and steel, blast furnaces	50	57	39,241	41,660	.83	.46
Iron and steel, steel works and rolling mills	47	32	183,249	375,088	3.89	4.12
Foundry and machine-shop products	58	51	350,327	482,767	7.43	5.31
Smelting and refining, copper, lead, and zinc	[1] 42	36	24,512	37,579	.52	.41
Automobile bodies and parts	30	1	[2] 1,810	132,556	.04	1.46
Automobiles	74	5	2,241	210,559	.05	2.31
Cars, steam-railroad, not including operations of railroad companies	86	90	33,453	52,298	.71	.57
Electric railroad repair shops	54	22	7,025	31,272	.15	.34
Steam-railroad repair shops	67	38	173,595	484,437	3.68	5.33
Agricultural implements	49	57	46,582	54,368	.99	.60
Rubber goods, not elsewhere specified	[3] 66	[4] 14	20,404	119,848	.43	1.32
Shipbuilding, steel	47	7	30,906	344,014	.66	3.78
Electrical machinery, apparatus, and supplies	47	17	42,013	212,374	.89	2.33

[1] Unweighted average of percentages given in Census Bull. 93, for smelting and refining of copper, lead, and zinc, respectively.
[2] For 1904, earliest date reported by the census.
[3] "Rubber and elastic goods."
[4] Per cent borne by employees in "rubber and elastic goods" in specified week of 1904 to average number in "rubber goods, not elsewhere specified," in 1919.

Chapter II

GENERAL SUMMARY

Before we attempt to present in summary form the general results of the analysis, there are given in Table 15 certain estimates of the amounts of per capita earnings, derived from different parts of the analysis and which, therefore, serve to some extent as mutual checks upon the accuracy of all of the results. These results can not be taken as exact to the decimal place. They are careful estimates—no more—and, especially in the case of the estimates of *amounts* of earnings, they are subject to some margin of error. The unavoidable dependence upon averages (even, in a few cases, upon averages of averages) and the necessity of resort to the device of interpolation to bridge intercensal gaps in the data—both militate against accuracy. Over against these untoward factors in the analysis must be set circumstances which, it is believed, go far to offset them, the great comprehensiveness of the basal census data, already reflected in the figures presented in the preceding chapter, and the close correlation which appears to exist between the results reached in this monograph and such authoritative unofficial reports on wages in manufacturing industries as are shortly to be brought in for comparison.

The figures given in the first column of Table 15 are amounts of per capita money earnings for all industries combined in each census year from 1899 to 1925, inclusive. These are the sums arrived at by methods elsewhere described and which are presented in greater detail in Chapter IV. In the next column are given the median industry

Table 15.—Comparison of Estimated Per Capita Amounts of Earnings (Nominal and Real), for All Industries Combined, with the Median Industry Averages and Median State Averages, by Census Years: 1899–1925

Census year	Money earnings			Real earnings [1]		
	Per capita, all industries combined	Median industry average	Median State average	Per capita, all industries combined	Median industry average	Median State average
1899	$446	$461	$449	$603	$623	$607
1904	483	504	492	582	600	593
1909	557	583	573	640	670	659
1914	576	616	592	576	616	717
1919	1,212	1,223	1,283	677	683	591
1921	1,047	1,103	1,041	595	627	772
1923	1,317	1,504	1,297	839	890	----
1925	1,402	1,448	----	823	852	----

[1] Expressed in dollars of 1914 purchasing power.

averages spotted in ordinal arrays of the 41 selected industries. The figures in the first column, of course, include all of the industries reported by the census, some 356 industries. The corresponding figures for the median industry of the 41 selected industries constitute, however, an average (in this case a median) not for all industries reported by the census but only for the 41 selected industries which include, as has been noted, about 70 per cent of the wage earners in all manufacturing industries. It will be observed, in comparing the first two columns, that per capita money earnings for the median industries in each year since 1899 are higher than the per capita earnings for all industries combined. The inference seems to be warranted that the small and relatively unimportant industries, 300 in number, which are not reported separately in this survey and which employ only 30 per cent of all wage earners, pay somewhat lower wages, or provide less regular employment than the large industries, with the result that the wage earners in them receive lower earnings than wage earners in our selected industries. In other words, the selected industries are, on the whole, the higher paid industries. In the third column are given the median State averages. These averages include all of the States, and, of course, within each State, all industries. As is to be expected, the State medians, because of their greater industrial inclusiveness, generally are lower than the industry medians. In the right-hand part of the table are the same three series of figures for real earnings.

A comparison is made in Table 16 of the results obtained in the main part of the survey and the corresponding results obtained from the special study (reported in Part IV) of original establishment schedules in 20 industries and 8 cities. The more important figures are, of course, those for actual money earnings on the right-hand side of the table. The results in Part IV, it should be remembered, are based upon a sample and any case of doubt therefore will have to be resolved in favor of the estimates which emerge from the main analysis, if for no other reason than that the latter rest upon a broader statistical base. There is for all industries combined a difference of a little over $100 between the per capita average for all the manufacturing industries reported by the census and the corresponding median based upon analysis of 10,372 individual firms. If, instead of the median, the arithmetic mean is used, the difference is somewhat less. In the case of the corresponding figures for each of the 20 industries for which samples were large enough to warrant a separate showing, there is greater difficulty in measuring the difference, because the individual industry figures in Part II are presented for men and women separately. However, taking into account the naturally higher wages of men, there is a fairly close correspondence in the case of most of the industries listed.

TABLE 16.—COMPARISON OF RESULTS OBTAINED IN MAIN PART OF ANALYSIS WITH THOSE OBTAINED IN SPECIAL STUDY OF VARIABILITY, 1919

INDUSTRY	FULL-TIME MONEY EARNINGS PER CAPITA			ACTUAL MONEY EARNINGS PER CAPITA			
	Part II—Estimated average		Part IV—Median [1]	Part II—Estimated average		Part IV—	
						Median [2]	Weighted arithmetic mean
All industries [3]			$1,433	$1,377		$1,212	$1,316	$1,272
	Male	*Female*	*Male and female*	*Male*	*Female*	*Male and female*	*Male and female*
Slaughtering and meat packing [4]	1,627		1,541	1,484		1,541	1,544
Iron and steel, steel works and rolling mills	2,155		1,644	1,728		1,521	1,526
Automobiles	1,739		1,499	1,278		1,456	1,456
Car and general construction and repairs, steam-railroad repair shops	1,797		1,433	1,394		1,433	1,392
Printing and publishing, newspapers and periodicals	1,442	650	1,453	1,330	599	1,423	1,466
Foundry and machine-shop products	1,828		1,360	1,450		1,289	1,322
Brass, bronze, and copper products			1,322			1,249	1,202
Furniture	1,454		1,292	1,192		1,244	1,253
Mineral and soda waters	975	495	1,154	866	440	1,121	1,160
Clothing, women's [5]	1,970	1,041	1,214	1,586	838	1,120	1,227
Boots and shoes, other than rubber	1,505	963	963	1,342	859	949	1,016
Tobacco, cigars and cigarettes	1,094	608	832	907	504	704	758

[1] Per capita full-time amount for establishment employing median wage earners.
[2] Per capita amount paid in establishment employing median wage earners; this is not the same, necessarily, as the median establishment.
[3] "All industries" in variation study includes only 20 industries in 8 cities.
[4] Industry used in variation study: "Slaughtering, wholesale, not including meat packing."
[5] Large differences possibly due to fact that Chicago was not included in variation analysis.

COMPARISON OF CENSUS RESULTS WITH OTHER ESTIMATES OF EARNINGS

A comparison of the results reached in this book with those arrived at by the National Bureau of Economic Research and, for two isolated years, by the National Industrial Conference Board, are presented in Table 17. The figures from the National Bureau of Economic Research are per capita annual earnings in manufacturing industries, excluding clerical and salaried employees.[1] A comparison of the national bureau's figures with those in the preceding column, which contains the estimates made in this monograph for actual earnings per capita, is reassuring as to the approximate accuracy of the present estimates of amounts of earnings. In the second column of the table are presented adjusted census estimates of *full-time* per capita earnings and, as is to be expected, these latter in all years are higher than the national bureau's figures for actual earnings.

In the first column of Table 17 is the series of census average wage[2] items. It is included here in order to indicate how inadequate they

[1] The original figures include salaried workers, but the bureau has kindly permitted us to use its unpublished estimates, from which salaried workers are excluded.
[2] See initial paragraph, Chap. XIII, p. 269.

would prove to be if one were to assume that they represented either rates of full-time earnings or actual earnings.

It might be supposed, at first blush, that sufficiently accurate estimates of amounts of actual per capita earnings might be made by direct multiplication of the estimated fractions of full employment by the census average wage—this latter item being taken to measure very closely the amounts of "full-time per capita earnings." Unfortunately, this relatively simple and direct procedure does not appear to produce as reliable results as those arrived at by the more complicated analysis which has been used in this monograph. Illustrative figures of the more direct method are given in column B, Table 17. The resulting sums are much lower than any of the other

TABLE 17.—COMPARISON OF VARIOUS ESTIMATES OF ANNUAL MONEY EARNINGS, PER CAPITA

YEAR	Census average wage	"A" × ratio actual to full employment	Hypothetical "full-time earnings"	Estimated actual per capita earnings ("C" × employment ratio)	National Bureau of Economic Research (factories, excluding clerical and salaried) [1]	National Industrial Conference Board, weekly earnings figures × 51 (23 industries) [1]	Other estimates
	A	B	C	D	E	F	G
1909	$518	$449	$643	$557	$499		
1910	529	451	654	559	548		
1911	536	430	662	534	521		
1912	554	477	684	592	569		
1913	576	497	712	617	600		
1914	580	464	719	576	539	$640	
1915	592	490	732	608	589		
1916	684	619	846	768	727		
1917	793	693	980	860	836		
1918	1,039	887	1,284	1,104	1,007		[3] $1,349
1919	1,158	975	1,433	1,212	1,081		
1920	1,393	1,200	1,722	1,488	1,409	1,498	[4] 1,503
1921	1,180	846	1,462	1,047	916	1,204	[4] 1,027
1922	1,152		1,424	1,171		1,226	
1923	1,267		1,566	1,317		1,354	

[1] National Bureau of Economic Research, unpublished manuscript. These figures have been kindly placed at the disposal of the writer by the directors of the national bureau.

[2] Reprinted by permission. National Industrial Conference Board, Wages in the United States (New York, 1926), p. 36. The figures given in column F are derived from the board's weekly earnings figures, shown quarterly, except that for 1920 and 1922 only the third and fourth quarters are reported and for 1914 data are given only for the month of July.

[3] Bureau of Labor Statistics Bull. 357, p. 4: Average earnings income of husbands in 12,096 (wage earning and low or medium salaried) families in 92 cities in the United States.

[4] National Bureau of Economic Research: Employment, Hours, and Earnings in Prosperity and Depression, p. 110. Figures represent earnings per capita of wage earners attached to industry. Salaried employees are included.

estimates given in the table; too low, in the writer's opinion, to be considered seriously.[3] The difference between the amounts of the census average wage and the national bureau's estimates of actual earnings, on the one hand, and the present estimates of full-time

[3] The direct products are 20 per cent lower than the estimates shown in column D; the census average wage item itself, moreover, is 20 per cent lower than the present revised estimate of full-time annual earnings shown in column C.

earnings, on the other hand, is so great as to confirm the statement already made, that these census average wage figures, as absolute sums, mean little or nothing, and that they can be used only in the form of full-time relatives to aid in the estimation of amounts of earnings and as a stepping stone to the calculation of relatives of actual earnings. In the last two columns of Table 17 are presented some fragmentary figures from the National Industrial Conference Board's published wage statistics and from the report on "Employment, Hours, and Earnings," published by the National Bureau of Economic Research. The figures given in the column headed "National Industrial Conference Board" are obtained by multiplying that organization's weekly earnings figures by 51. The figures for 1920 and 1921 in the last column are in the form in which they appear in the national bureau's report. The correspondence, especially in 1920 and 1921, between the conference board's and the national bureau's figures, and those of this monograph, is quite close.

In Table 18 there is a comparison for the year 1921 containing separate estimates for the three geographic regions of the country,

TABLE 18.—COMPARISON OF CENSUS RESULTS FOR THREE GEOGRAPHIC REGIONS WITH RESULTS OBTAINED BY NATIONAL BUREAU OF ECONOMIC RESEARCH: 1921

REGION	CENSUS RESULTS			NATIONAL BUREAU'S ESTIMATE	
	Census average wage	Full-time earnings per capita	Actual earnings per capita [1]	Actual earnings per capita [2]	Per capita of employees on pay rolls [3]
United States	$1,180	$1,462	$1,047	$1,027	$1,355
Northeast	1,223	1,521	1,053	1,029	1,358
South	906	1,100	768	903	1,191
West	1,386	1,685	1,249	1,213	1,600

[1] Of all wage earners attached to industry, excluding salaried employees.
[2] Of all wage earners attached to industry. Figure for United States as a whole from National Bureau of Economic Research, Employment, Hours, and Earnings. Corresponding figures for the 3 regions calculated from figures in last column on the basis of the ratio between 1,027 and 1,355.
[3] Including salaried employees. Computed from figures on number of employees and corresponding figures on quarterly wages and salaries kindly furnished the writer by the National Bureau of Economic Research, which did not publish in its report per capita earnings by geographic divisions. Figures given are the aggregates of the 4 quarterly quotients obtained by dividing the amount paid out in wages and salaries in each quarter of the year by the number of employees on the pay roll in that quarter.

between our own estimates of per capita earnings and those published by the National Bureau of Economic Research in its report on "Employment, Hours, and Earnings," already referred to. It must be remembered that the national bureau's estimates include clerical and salaried employees. The last two columns of the table are based upon two types of estimates. The next to the last column contains the national bureau's estimate of the actual money earnings per capita of all manufacturing wage earners *attached to the various manufacturing industries*. The figures for the United States as a whole are given in the form reported by the national bureau. The

figures for the three geographic regions are interpolated from the figures in the last column, on the basis of the ratios between the amount for the United States as a whole ($1,355) and the three regional amounts shown below it. The national bureau's figures for the United States as a whole are obtained by dividing the quarterly amounts paid out in wages by the number of employees on pay rolls in the peak quarter of the period which its investigation covered, this being, for factories, the third quarter of 1920. Its second estimate, shown in the last column, reports estimated money earnings per capita of employees on pay rolls. This latter number of employees is, of course, smaller than the number attached to the industry, and the resulting quotient represents, therefore, higher money earnings received per capita. These figures are obtained by dividing the total quarterly amounts paid in wages and salaries in concerns reported in the national bureau's investigation by the number of employees on the pay roll in the same quarterly period.[4] The figures shown in Table 18 are, of course, the aggregate of the four quarterly quotients which the national bureau derived from the returns received in its investigation.

TABLE 19.—COMPARISON OF INDEXES OF RATES OF WAGES, PER CAPITA, OF UNSKILLED LABORERS IN MANUFACTURING INDUSTRIES WITH INDEXES OF EARNINGS FOR ALL MANUFACTURING WAGE EARNERS: 1899–1924

[1914=100]

YEAR	INDEX NUMBERS OF ANNUAL MONEY WAGES		YEAR	INDEX NUMBERS OF ANNUAL MONEY WAGES	
	Wage rates, unskilled manufacturing laborers [1]	Earnings, all manufacturing wage earners		Wage rates, unskilled manufacturing laborers [1]	Earnings, all manufacturing wage earners
1899	81.3	77	1912	95.5	103
1900	82.4	78	1913	100.2	107
1901	84.5	82	1914	100.0	100
1902	86.4	86	1915	100.4	106
1903	89.0	86	1916	122.0	133
1904	89.8	84	1917	151.0	149
1905	90.6	93	1918	188.0	192
1906	94.5	99	1919	217.6	210
1907	98.2	101	1920	247.0	258
1908	93.2	86	1921	191.2	182
1909	94.4	97	1922	188.3	203
1910	96.9	97	1923	206.8	229
1911	93.7	93	1924	207.0	227

[1] Reproduced by permission of the author from Coombs, Whitney, Wages of Unskilled Labor in Manufacturing Industries in the United States, 1890–1924. (New York: Columbia University Press: 1926), p. 99. Mr. Coombs' 1913 base is here shifted to 1914

A comparison of the results of an independent analysis of the wages of unskilled manufacturing laborers with the index of money earnings developed in these pages is made in Table 19. A close correspondence

[4] The figures used are from data kindly furnished the writer by the directors of the National Bureau of Economic Research. They are not weighted (as are the published figures for the United States as a whole) with the numbers in the different industries reported by the census. The published results of the bureau's investigation do not include any report of per capita earnings by geographic regions.

in the fluctuations—especially in respect to timing—is to be observed. The narrower amplitude of fluctuation in the index for unskilled labor, is no doubt, chiefly attributable to the fact that it is based on wage rates, whereas the present study rests on earnings.

EARNINGS FOR ALL INDUSTRIES COMBINED

Figures which indicate the final results obtained, both for the United States as a whole and for all industries combined, and which also indicate in a general way the process by which the final figures are arrived at, are given in Table 20. The table includes not only the manufactures census years, but also estimates for intercensal years which have been interpolated after the manner explained in Chapter XIX. Figures in column 1 are census average[5] amounts obtained for the census years by dividing the amount paid in wages by the number of wage earners as reported by the census. The second column contains estimated amounts of "full-time earnings" for corresponding years and derived from the census averages by way of the amounts of average weekly earnings in 1904, reported in Census Bulletin 93. In the third column are given the estimated ratios of actual to full employment which when multiplied by figures in the preceding column produce the estimated amounts of actual money earnings per capita shown in column D. In the fourth column (E) is the index of the cost of living, which is constructed as explained in Chapter XVII and which, when divided into the actual money earnings of column D, produces the estimated amounts of the purchasing power of money earnings, in 1914 dollars, as shown in column F. The figures in the last column, showing the estimated per capita amount of gain or loss in the purchasing power for each year since 1899, will be discussed presently.

The figures of columns A, B, C, and D of Table 20 are plotted in graphic form in Figure 4, which shows by the length of the bars the amounts of per capita earnings in all industries. The crosses on the bars indicate the amounts of the census average wage for each year. In most of the years it is evident that this simple census average is very close to the quantity described as "actual money earnings." But in some years, indeed, in most of the years since 1915, there is a very wide margin between these items. The disparity between them is, on the whole, so great as to make the census average wage,[5] per se, entirely unsatisfactory as a measure of labor incomes. Nor is the relationship between the census average wage and the amounts of *full-time* money earnings (the full length of the bars in fig. 4) without significance. The wide margin between them certainly indicates, if there be any validity in the method by which "full-time earnings"

[5] See initial paragraph, Chap. XIII, p. 269.

are calculated in this monograph, that the census average wage can not be used as a measure of absolute amounts of "full-time earnings." An inspection of Figure 4 will show that, although a wide margin in absolute dollar sums exists between the census average wage and

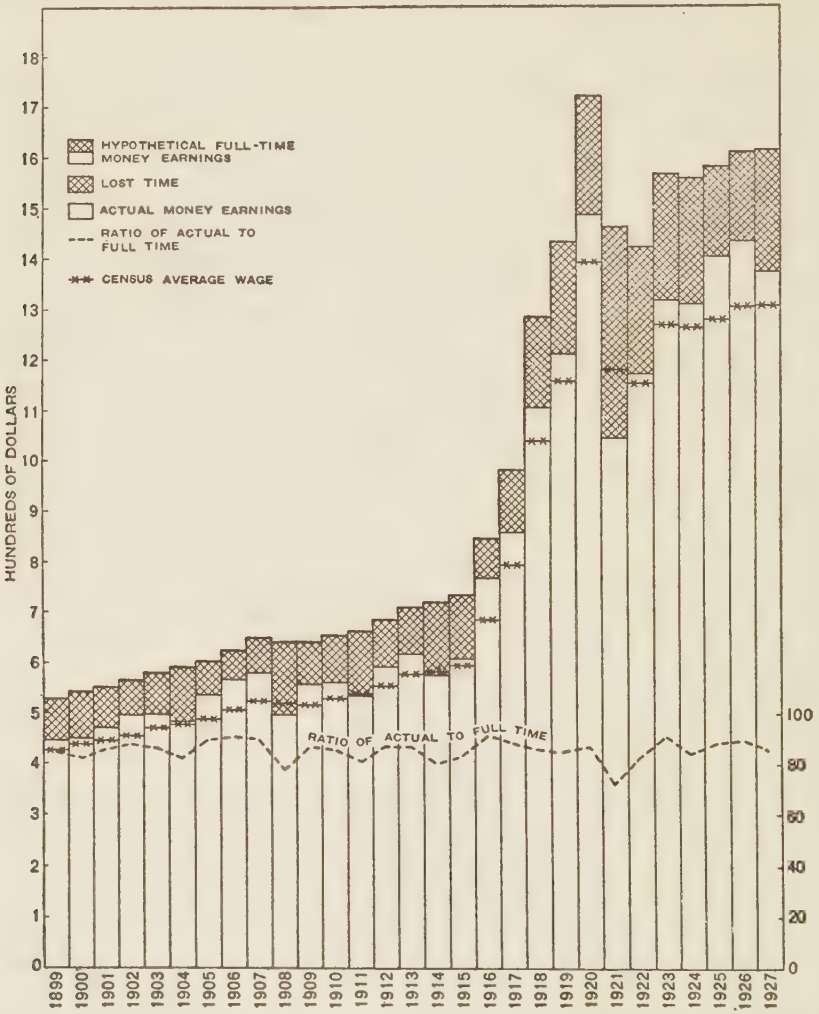


FIG. 4.—ILLUSTRATION OF THE PRINCIPAL STEPS IN THE DERIVATION OF MONEY EARNINGS FROM CENSUS AVERAGE WAGE, ALL INDUSTRIES: 1899–1927

full-time earnings, there is, nevertheless, a fairly constant relationship between them; the former item is 20 per cent lower than the latter, and this relationship holds good throughout the 29-year period. If the two series were plotted as line curves on a ratio chart, they would be parallel. It follows that *changes* in the census average wage amounts faithfully reflect *changes* in "full-time earnings."

This being so, the index number of the census average wage figures are relied upon in following chapters as points of departure for the estimation of index numbers of both actual money earnings and actual real earnings.

TABLE 20.—CHIEF STEPS IN DERIVATION OF ESTIMATES OF REAL EARNINGS FROM THE CENSUS AVERAGE—UNITED STATES, ALL INDUSTRIES COMBINED

YEAR	Census average wage A	Estimated full-time money earnings B	Estimated ratio, actual to full employment C	Actual money earnings D	Index of cost of living 1914=1000 E	Purchasing power of money earnings in 1914 dollars F
1899	$426	$525	0.849	$446	0.74	$603
1900	440	544	.825	449	.76	591
1901	447	552	.854	471	.78	604
1902	458	566	.878	497	.80	621
1903	469	579	.860	498	.84	593
1904	477	590	.819	483	.83	582
1905	487	602	.891	536	.83	646
1906	506	626	.908	568	.86	660
1907	526	650	.891	579	.91	636
1908	520	643	.772	496	.87	570
1909	518	643	.866	557	.87	640
1910	529	654	.854	559	.92	608
1911	536	662	.807	534	.95	562
1912	554	684	.866	592	.96	617
1913	576	712	.866	617	.99	623
1914	580	719	.801	576	1.00	576
1915	592	732	.831	608	.98	620
1916	684	846	.908	768	1.07	718
1917	793	980	.878	860	1.29	667
1918	1,039	1,284	.860	1,104	1.57	703
1919	1,158	1,433	.846	1,212	1.79	677
1920	1,393	1,722	.864	1,488	2.05	726
1921	1,180	1,462	.716	1,047	1.76	595
1922	1,152	1,424	.822	1,171	1.66	705
1923	1,267	1,566	.905	1,317	1.69	839
1924	1,262	1,560	.840	1,310	1.69	776
1925	1,280	1,582	.886	1,402	1.70	825
1926	1,302	1,610	.892	1,436	1.73	830
1927 [1]	1,304	1,612	.852	1,373	1.71	805

[1] The figures for 1927, in this and other tables of earnings for all industries combined, have been exterpolated from the estimates for 1925, with the aid of the indexes of employment and of pay roll published by the United States Bureau of Labor Statistics. Official census data on wage earners and wages for "All industries" for 1927 (in press release for Feb. 28, 1929) were not available until after these calculations had been made and page proof reached. The census average wage calculated from these preliminary official figures is $1,299.

The purpose of Figure 4 is not to throw light on amounts of earnings only. It may be made to serve as well as would a line chart based upon index numbers, for a discussion of the question of gains and losses in purchasing power. As to amounts of earnings, we can only draw conclusions as between different years on the basis of the lengths of bars drawn to the scale of deflated—that is to say, real—earnings. It appears from these magnitudes that in terms of dollars having the purchasing power of dollars in 1914, earnings have ranged in per capita amount between $562 and $839 a year. The several causes of successive ups and downs in purchasing power during the 29-year period need not be discussed here, inasmuch as they are con-

sidered in some detail in Chapter IX. The 29-year period concludes with a rise in purchasing power that is more precipitate than in any of the previous years in the period studied. It would appear, in so far as we can rely upon the figures upon which the chart is based, that the manufacturing wage earner was in 1925 far better off than he had been during any earlier part of the twentieth century. His real earnings in 1925 were 37 per cent higher than his real earnings of 1899 and 43 per cent higher than 1914. In 1927 the buying power of his earnings was 34 per cent above 1899 and 40 per cent above 1914. Since 1899 his real earnings have increased at an average rate of about 1 per cent a year. However, the wage earner has had to live and bring up his family not only in 1925; he has had to buy food and clothing and shelter from week to week throughout each year of the 29 years reported. And, generally speaking, he has had to buy those things with the earnings of the current year, so that it may often have happened that he had in a year of high-purchasing power, to spend a part of that purchasing power in the payment of debts contracted in a preceding year of very low purchasing power. It is important, therefore, to endeavor to ascertain to what extent gains or losses in purchasing power in certain years are gains or losses net. The year 1899 was not a year of marked business depression. It was on the contrary rather prosperous, yet not so prosperous a business year as to make it entirely inappropriate to consider it as approximating a normal year. At any rate it is distinctly more representative a year from which to measure approximate gains and losses than the extremely low year 1914. It furthermore has the advantage of being the first year covered by the present analysis.

If, then, the purchasing-power level of 1899, estimated at $603, is projected through the 29-year period to the end of 1927, as indicated by the line across Figure 5 (based on columns D, E, and F of Table 20), we mark off the years in which wage earners have received in earnings a larger purchasing power, and those years in which they received a smaller purchasing power than they received in 1899. The progress made by wage earners in respect to their real earnings then would be measured rather by a comparison of the area above and below this line than by reference to the relation between what is, very possibly, a temporary high peak in 1925 and the level of 1899. There were evidently only seven years in which the average wage earner lost ground in respect to the purchasing power of his money earnings *as compared with 1899*. But, reckoning from year to year, it appears that he suffered losses in real wages in 13 years out of 29. Now, of course, it would be absurd to pretend that these estimates are statistically accurate to the last dollar, or even to the last few dollars. They are not at all accurate in that sense; yet it is believed that the general picture which they form does not seriously misrepresent the actual

situation. It is not forgotten, either, that we are speaking of *average* wage earners, who have a merely hypothetical existence. It is of course true that, despite the implications of the foregoing statements, there were many wage earners who did not achieve any net gain in purchasing power during the 29-year period, and it is equally true that there were many wage earners who achieved even greater net

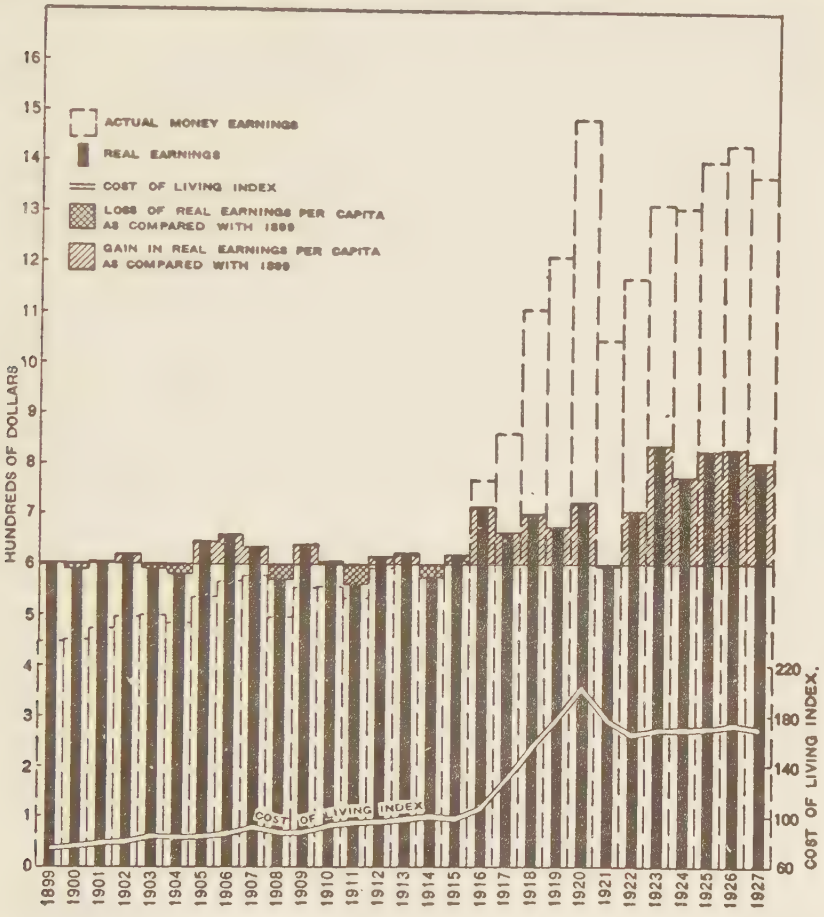


FIG. 5.—ILLUSTRATION OF PRINCIPAL STEPS IN THE DERIVATION OF REAL EARNINGS FROM CENSUS AVERAGE WAGE, ALL INDUSTRIES: 1899-1927

gains in purchasing power than are indicated here. It seems altogether likely that, as to a very large proportion of the manufacturing wage earners in the United States, the balance of loss and gain is fairly close to that indicated in the chart.

It would seem that on surveying the pre-war part of the period that the American wage earner did not make any gains in real earnings which were not in a large measure canceled out, in effect, by losses in

real earnings in other years of the period. The years following the war tell a different story: Only once—in 1921—have real earnings fallen below their level of 1899; in every other postwar year they were much higher than in 1899. It seems quite certain that the manufacturing wage earner has achieved permanently higher levels of real wages. History probably will record the last decade as the one to witness quite unprecedented gains in the purchasing power of wage earners. The gain between 1914 and 1927 was at the rate of nearly 4 per cent a year. But it must not be forgotten that the 15 years following 1899 saw practically no gains.

It is realized, of course, that this analysis of the problem oversimplifies the situation. We have to deal not simply with the cost of living; standards of life have also to be reckoned with. These standards, in our manufacturing communities as elsewhere, have risen considerably since 1899. This means that, if progressively improving standards of life are to be maintained, the wage earner must be able to do more than earn enough in 1927 to buy the same quantity and kind of commodities he bought in 1899. He must be enabled, by his money earnings, to get more and better commodities, else his higher standards of life will crumble. The above discussion of net gains and losses in real earnings has proceeded deliberately without reference to changes in living standards, in order to try to ascertain in how far earnings have served to meet the costs of living, with standards assumed to be stationary.

The figures (as charted in fig. 4 and elsewhere) do show that since the low-purchasing power year 1914 there have been enormous gains in purchasing power (which are net, so far as the past decade is concerned). And these gains have made it possible for many wage earners to make up deficits hanging over from the previous decade, but also to purchase the larger volume of better and more varied commodities, which represent those elevated standards of life which, for many wage earners, actually have been made realities since 1914.

NET BALANCES IN INDIVIDUAL INDUSTRIES

We get closer to actual situations when we deal with separate industries. Then, despite the fact that we are dealing with nebulous averages, we are probably nearer to the actual sums concealed by those averages. Fortunately there are 12 of the selected industries for which we can show the estimated amounts of real earnings for the intercensal as well as the census years. In Figures 6A and 6B the results for these industries are given in graphic form, the figures for the chart being based upon Table 63, on page 144.

It is evident, as we should expect, that there are wide differences among these 12 industries in respect to purchasing power variations

from the buying power of the wage earners in those industries in 1899.

Not all of these industries brought to their workers slumps in purchasing power in 1921; all of them, however, with the single exception of the silk industry, in which there was no change experienced gains in purchasing power from 1922 to 1923. Most of them reached new high levels in 1923. The tobacco industry is notable for the fact that in nearly every year for which we have record since 1899 the purchasing power of per capita earnings has been lower than it was in 1899. All of the 12 industries, except automobile manufacturing, suffered losses in real earnings per capita from 1923 to 1924; these losses, however, in 6 of the industries were pretty largely canceled by gains between 1924 and 1925. Among the 12 industries the only one in which annual real earnings per capita never once, during the years from 1900 to 1927, declined again to a point as low as that at which they stood in 1899 is the woolen industry. Such gains are needed in this industry if they are needed anywhere; it was, and despite its gains still remains, a low-wage industry. In 1899 its average was by far the lowest of the 12 industries now being discussed. The tobacco industry which since 1899 has been witnessing an almost continuously declining average of real wages, in 1899 was safely above the bottom of the list; it has the poorest record of all the 41 industries included in this analysis. It is the only industry of the 12 for which annual data are reported in these pages to come to the year 1927 with a real wage below that of 1899. Even among the 41 industries there is no industry, except tobacco, that shows a lower real wage level in 1923 than in 1899.

THE INDEX NUMBERS

Almost without exception the index numbers published in this monograph are put upon the 1914 base. This procedure has been dictated by practical considerations and carries no assumption that 1914, more than any other year, has special significance as a standard from which to calculate losses and gains in real earnings. Indeed, we have just used the year 1899 as a point of departure without intending to make any assumption as to whether real earnings were adequate or inadequate at that time.

The relative numbers corresponding to the absolute dollar amounts shown in Table 20 are given in Table 21, which lists in parallel columns index numbers of "full-time money earnings," factory employment, actual money earnings, the cost of living, and real earnings. The data of the first three columns are plotted in Figure 7.

In order not to distort the degrees of change the data have been plotted on a logarithmic scale—that is to say, a scale in which equal percentages of change either up or down—are shown by the

ESTIMATED AVERAGE AMOUNTS OF REAL LABOR INCOME IN 12 SELECTED

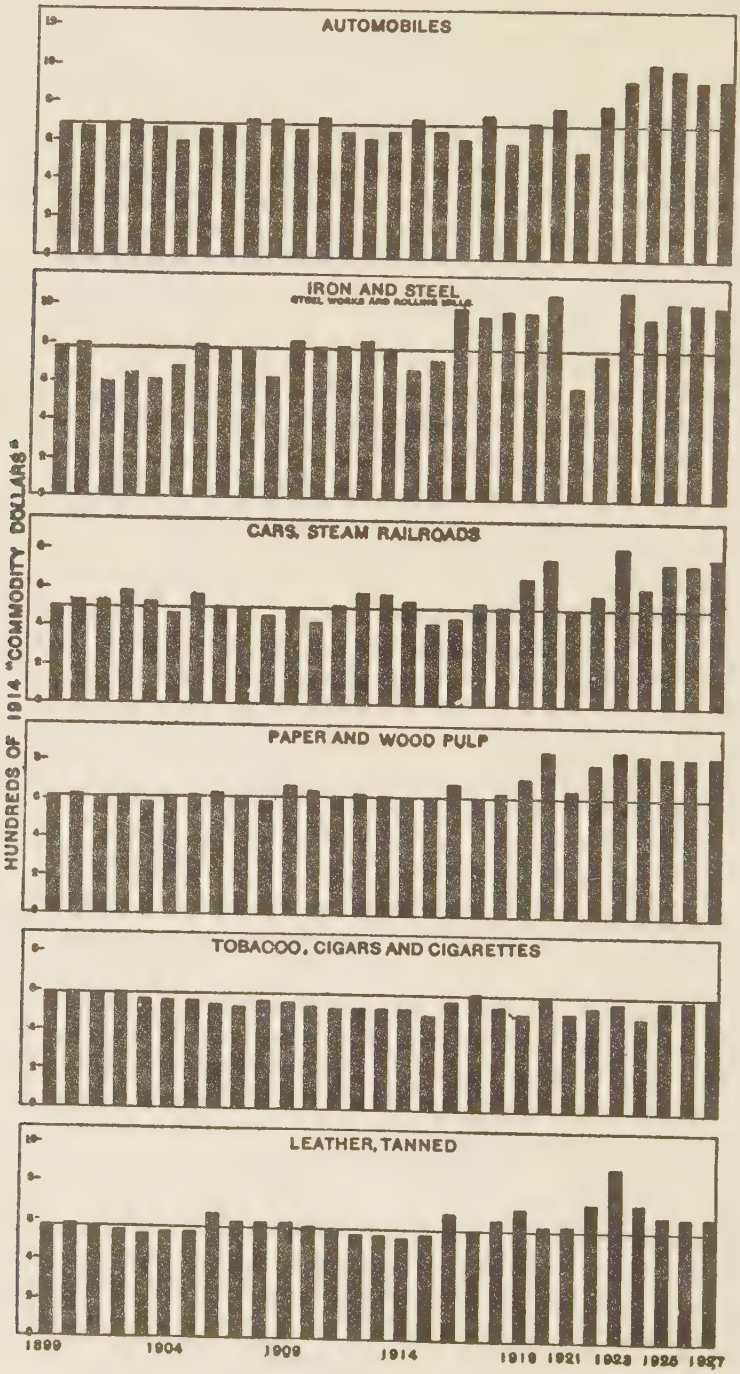


FIG. 6A

INDUSTRIES, 1899–1927. (UNIT: DOLLAR OF 1914 PURCHASING POWER.)

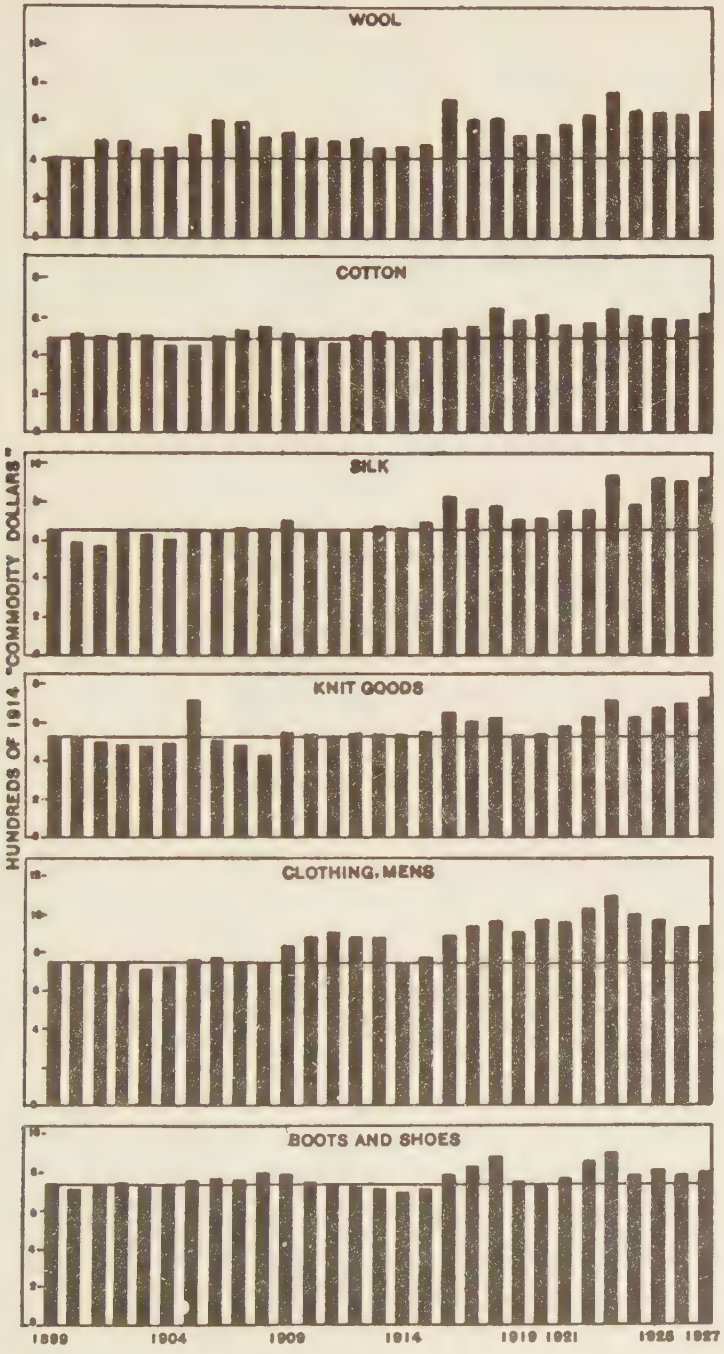


FIG. 6B

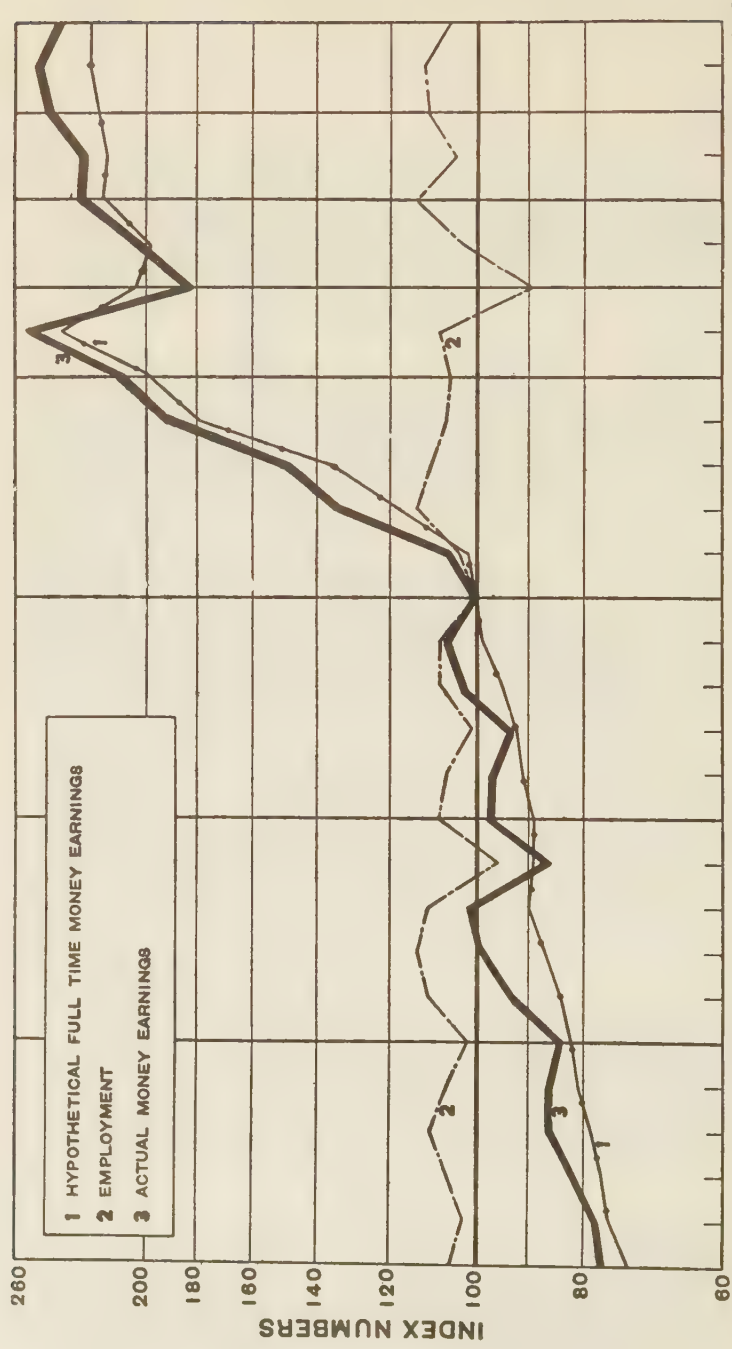


FIG. 7.—INDEX NUMBERS OF HYPOTHETICAL FULL-TIME EARNINGS, EMPLOYMENT, AND ACTUAL MONEY EARNINGS, ALL INDUSTRIES, 1899–1927

traversing of equal distances up or down on the chart. On this chart are shown the prime factors affecting money earnings. The solid line representing "hypothetical full-time earnings," or annual rates of wages, is naturally smoother than the line representing actual money income, because full-time earnings, unlike actual earnings, are not affected by fluctuations in employment. The actual money earnings (or labor incomes) of factory wage earners depend upon both wage rates and the amount of employment. Real earnings

TABLE 21.—INDEX NUMBERS OF (1) HYPOTHETICAL FULL-TIME MONEY EARNINGS; (2) EMPLOYMENT; (3) ACTUAL MONEY EARNINGS; (4) THE COST OF LIVING; AND (5) THE PURCHASING POWER OF ACTUAL MONEY EARNINGS, IN THE UNITED STATES, ALL INDUSTRIES, EACH YEAR: 1899–1927

YEAR	INDEX NUMBERS OF—					Link relatives of change in real earnings from preceding year
	Hypothetical full-time money "earnings"	Employment	Money earnings, actual	The cost of living	Real earnings	
1899	73	106	77	74	105	
1900	76	103	78	76	103	−2.0
1901	77	107	82	78	105	2.2
1902	79	110	86	80	108	2.8
1903	81	107	86	84	103	−4.5
1904	82	102	84	83	101	−1.9
1905	84	111	93	83	112	11.0
1906	87	113	99	86	115	2.2
1907	90	111	101	91	110	−3.6
1908	89	96	86	87	99	−10.4
1909	89	108	97	87	111	12.3
1910	91	107	97	92	106	−5.0
1911	92	101	93	95	98	−7.6
1912	95	108	103	96	107	9.8
1913	99	108	107	99	108	1.0
1914	100	100	100	100	100	−7.5
1915	102	104	106	98	108	7.6
1916	118	113	133	107	125	15.8
1917	136	110	149	129	116	−7.1
1918	179	107	192	157	122	5.4
1919	199	106	210	179	118	−3.7
1920	239	108	258	205	126	7.2
1921	204	89	182	176	103	−18.0
1922	198	103	203	166	122	18.5
1923	218	113	229	169	146	17.0
1924	217	105	227	169	135	−7.5
1925	220	111	243	170	143	6.0
1926	224	112	249	173	144	1.0
1927	224	106	238	171	140	−2.5

depend in part upon changes in the cost of living, in part upon wage rates, the equivalents of which are here reported, on an annual basis, as hypothetical full-time earnings, and finally, not least, upon the extent of unemployment.

The final factor of deflation is not introduced in Figure 7, because to do so would unduly crowd the picture. In Figure 8 the money income curve shown in Figure 7 is plotted along with the curve of "real" income obtained by deflating the nominal dollar amounts to

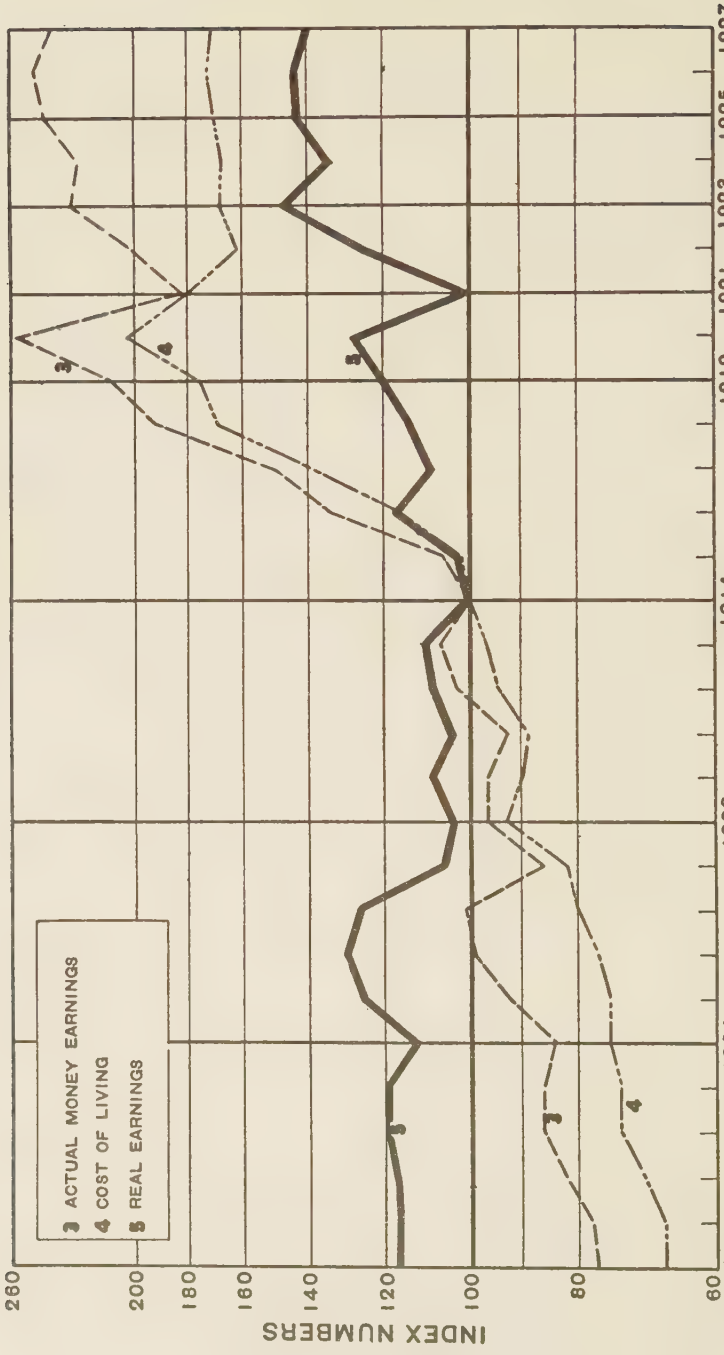


FIG. 8.—INDEX NUMBERS OF ACTUAL MONEY EARNINGS, THE COST OF LIVING, AND REAL INCOME, ALL INDUSTRIES, 1899–1927

the uniform purchasing-power basis of 1914. The index numbers of the cost of living, which are used in the process of deflation, are also plotted on the chart. The curve of real income shows the same general drift disclosed in Figure 5, where the absolute amounts of earnings are shown.

MONTHLY FLUCTUATIONS IN MONEY EARNINGS

A monthly index of the purchasing power of annual earnings, per capita of employed wage earners is given in Table 22. The index is derived with the aid of figures published by the United States Bureau of Labor Statistics reporting changes in the cost of living and in per capita earnings. The latter data have been reported monthly, first for 13 and later for as many as 53 manufacturing industries. Their utilization in combination with the annual figures shown in the preceding pages has rested upon the assumption that the desired relatives representing monthly fluctuations in the annual rate of (labor) income, per capita, must stand in the same positions, relative to the already computed annual rates for the year as a whole, as do the bureau's monthly relatives to the yearly average struck from them. For the years 1915 to 1924, inclusive, the Federal bureau's data were utilized in the form of the chain relatives calculated by the Federal Reserve Bank of New York. For the years 1924 to 1928, inclusive, the bureau's monthly index of total pay roll was divided by its index of employment, the quotient being assumed to represent relative changes in per capita earnings and so applied, as above explained, to the annual census estimates to produce the relatives in the first column of Table 22.

The annual data for intercensal years are interpolated by the method described in Chapter XIX. The resulting continuous series of annual data for the period 1915–1928 is thus made the point of departure for the calculation of the index numbers in the first column of Table 22. The figures of the second column, showing, for each month, the estimated annual labor income rate, are derived from the annual estimates [6] by applying to them the percentages of change indicated by the relatives of the first column.

The cost of living index in the middle column of Table 22 is derived from the reports of the United States Bureau of Labor Statistics on changes in the total cost of living in the United States. The starred items are the months for which the bureau has reported the cost of living, the base, however, being shifted to 1914. The indexes for the intervening months have been interpolated along a smooth curve, and are assumed to represent the most probable monthly trend of the cost of living. The cost of living index, divided into the index of

[6] From column D of Table 20.

money income in the first column, gives us an index of monthly changes in the annual rate of real earnings. From this, in the same fashion as for money income, are derived the monthly estimates (in the last column) of the annual rate of real earnings. The dollar amounts shown in Table 22 are plotted in Figure 9.[7]

TABLE 22.—MONTHLY FLUCTUATIONS IN MANUFACTURING LABOR INCOMES, PER CAPITA, OF EMPLOYED WAGE EARNERS, JANUARY, 1915, TO DECEMBER, 1928

MONTH	ESTIMATED MONEY EARNINGS PER CAPITA		Cost of living (1914=100)	ESTIMATED REAL EARNINGS PER CAPITA		ESTIMATED MONEY EARNINGS PER CAPITA		Cost of living (1914=100)	ESTIMATED REAL EARNINGS PER CAPITA	
	Indexes (1914=100)	Annual rate (dollars)		Indexes (1914=100)	Annual rate at 1914 prices	Indexes (1914=100)	Annual rate (dollars)		Indexes (1914=100)	Annual rate at 1914 prices
	A	B	C	D	E	A	B	C	D	E
	1915					1916				
January	103	591	1.009	102	589	124	716	1.031	120	692
February	103	591	1.010	102	589	131	757	1.042	126	727
March	105	602	1.011	104	600	131	757	1.052	124	715
April	104	596	1.012	103	594	131	757	1.063	123	710
May	105	602	1.013	103	594	135	780	1.074	125	721
June	106	608	1.014	104	600	135	780	1.085	124	715
July	105	602	1.015	103	594	126	728	1.096	115	664
August	107	614	1.016	105	606	134	775	1.106	121	698
September	106	608	1.017	104	600	135	780	1.117	121	698
October	110	631	1.018	108	623	135	780	1.128	120	692
November	112	642	1.019	110	635	139	803	1.139	122	704
December	112	642	*1.020	110	635	145	838	*1.150	126	727
	1917					1918				
January	136	785	1.169	117	676	160	923	1.406	114	658
February	136	785	1.188	115	664	161	926	1.432	112	646
March	140	808	1.207	116	669	177	1,018	1.459	121	698
April	136	785	1.226	111	640	181	1,041	1.485	122	704
May	147	848	1.245	118	681	191	1,098	1.511	126	727
June	149	860	1.264	118	681	193	1,110	1.538	125	721
July	145	838	1.283	113	652	199	1,144	1.564	127	733
August	149	860	1.303	112	646	204	1,173	1.591	128	739
September	151	871	1.322	114	658	206	1,185	1.617	127	733
October	160	923	1.342	119	687	207	1,190	1.644	126	727
November	169	975	1.361	124	715	201	1,156	1.672	120	692
December	171	987	*1.380	124	715	225	1,294	*1.700	132	762
	1919					1920				
January	199	1,144	1.703	115	664	257	1,483	1.970	130	750
February	189	1,091	1.707	111	640	250	1,443	2.000	125	721
March	192	1,104	1.710	112	646	263	1,518	2.030	129	744
April	195	1,124	1.714	114	658	260	1,492	2.058	126	727
May	199	1,144	1.717	116	669	265	1,529	2.088	127	733
June	209	1,206	*1.720	121	698	270	1,558	*2.110	128	739
July	210	1,212	1.756	119	687	262	1,512	2.083	125	721
August	216	1,246	1.792	120	692	268	1,546	2.056	130	750
September	226	1,297	1.828	124	715	267	1,541	2.029	131	756
October	226	1,297	1.864	121	698	253	1,452	2.002	128	739
November	230	1,320	1.902	121	698	246	1,419	1.976	125	721
December	249	1,437	*1.940	128	739	244	1,408	*1.950	125	721

* Asterisks mark months for which cost of living indexes are reported by Bureau of Labor Statistics.

[7] The index numbers are plotted in fig. 24 on p. 194.

TABLE 22.—MONTHLY FLUCTUATIONS IN MANUFACTURING LABOR INCOMES, PER CAPITA, JANUARY, 1915, to DECEMBER, 1928—Continued

MONTH	ESTIMATED MONEY EARNINGS PER CAPITA		Cost of living (1914=100)	ESTIMATED REAL EARNINGS PER CAPITA		ESTIMATED MONEY EARNINGS PER CAPITA		Cost of living (1914=100)	ESTIMATED REAL EARNINGS PER CAPITA	
	Indexes (1914=100)	Annual rate (dollars)		Indexes (1914=100)	Annual rate at 1914 prices	Indexes (1914=100)	Annual rate (dollars)		Indexes (1914=100)	Annual rate at 1914 prices
	A	B	C	D	E	A	B	C	D	E
	1921					1922				
January	187	1,079	1.910	98	565	195	1,124	1.667	117	676
February	189	1,091	1.870	101	583	200	1,154	1.644	121	698
March	192	1,104	1.830	105	606	197	1,137	*1.620	121	698
April	191	1,098	1.790	107	617	192	1,104	1.617	119	687
May	188	1,085	*1.750	107	617	197	1,137	1.614	122	704
June	188	1,085	1.743	108	623	203	1,171	*1.610	126	727
July	178	1,027	1.736	102	589	189	1,091	1.610	117	676
August	180	1,039	1.728	104	600	201	1,156	1.610	125	721
September	176	1,016	*1.720	102	589	204	1,173	*1.610	126	727
October	170	981	1.710	99	571	206	1,185	1.623	127	733
November	168	969	1.700	99	571	211	1,217	1.637	129	744
December	178	1,027	*1.690	105	606	214	1,235	*1.650	130	750
	1923					1924				
January	230	1,320	1.647	139	802	225	1,294	1.682	134	769
February	234	1,347	1.643	141	814	233	1,344	1.683	139	802
March	241	1,391	*1.640	146	842	228	1,308	*1.684	136	785
April	241	1,391	1.643	146	842	224	1,292	1.680	133	767
May	251	1,448	1.647	151	871	221	1,275	1.675	132	762
June	251	1,448	*1.650	151	871	218	1,251	*1.671	131	756
July	242	1,396	1.657	145	837	208	1,200	1.676	124	715
August	243	1,402	1.664	145	837	219	1,257	1.681	130	750
September	245	1,414	*1.670	146	842	221	1,275	*1.686	131	756
October	250	1,443	1.673	149	860	229	1,314	1.692	136	785
November	245	1,414	1.676	146	842	223	1,285	1.698	132	762
December	250	1,443	*1.680	148	854	229	1,314	*1.704	135	779
	1925					1926				
January	249	1,437	1.707	146	842	253	1,452	1.744	145	837
February	259	1,486	1.709	152	878	261	1,498	1.734	151	871
March	261	1,498	1.712	153	884	263	1,518	1.725	152	878
April	253	1,452	1.714	148	854	260	1,492	1.715	152	878
May	259	1,486	1.717	151	871	260	1,492	1.706	152	878
June	253	1,452	*1.719	147	848	260	1,492	*1.697	153	884
July	249	1,437	1.725	144	832	253	1,452	1.699	149	860
August	253	1,452	1.730	146	842	260	1,492	1.700	153	884
September	246	1,419	1.736	142	820	256	1,469	1.701	151	871
October	259	1,486	1.742	149	860	265	1,529	1.703	156	900
November	259	1,486	1.748	148	854	260	1,492	1.704	153	884
December	261	1,498	*1.753	149	860	262	1,512	*1.705	154	889
	1927					1928				
January	253	1,460	1.722	147	848	253	1,460	1.687	150	865
February	263	1,578	1.718	153	884	261	1,506	1.684	155	900
March	266	1,535	1.715	155	895	264	1,530	1.680	157	910
April	265	1,529	1.711	155	894	261	1,506	1.677	155	900
May	265	1,529	1.708	155	895	261	1,506	1.674	156	905
June	260	1,500	1.704	153	880	261	1,506	*1.670	156	905
July	254	1,466	1.702	149	861	256	1,480	1.672	153	884
August	259	1,495	1.700	152	879	259	1,497	1.673	155	900
September	255	1,472	1.697	150	867	259	1,497	1.675	154	888
October	259	1,495	1.695	153	882	267	1,550	1.677	159	919
November	254	1,466	1.692	150	866	259	1,495	1.678	154	888
December	260	1,500	1.690	154	888	264	1,530	*1.680	157	910

*Asterisks mark months for which cost of living indexes are reported by Bureau of Labor Statistics.

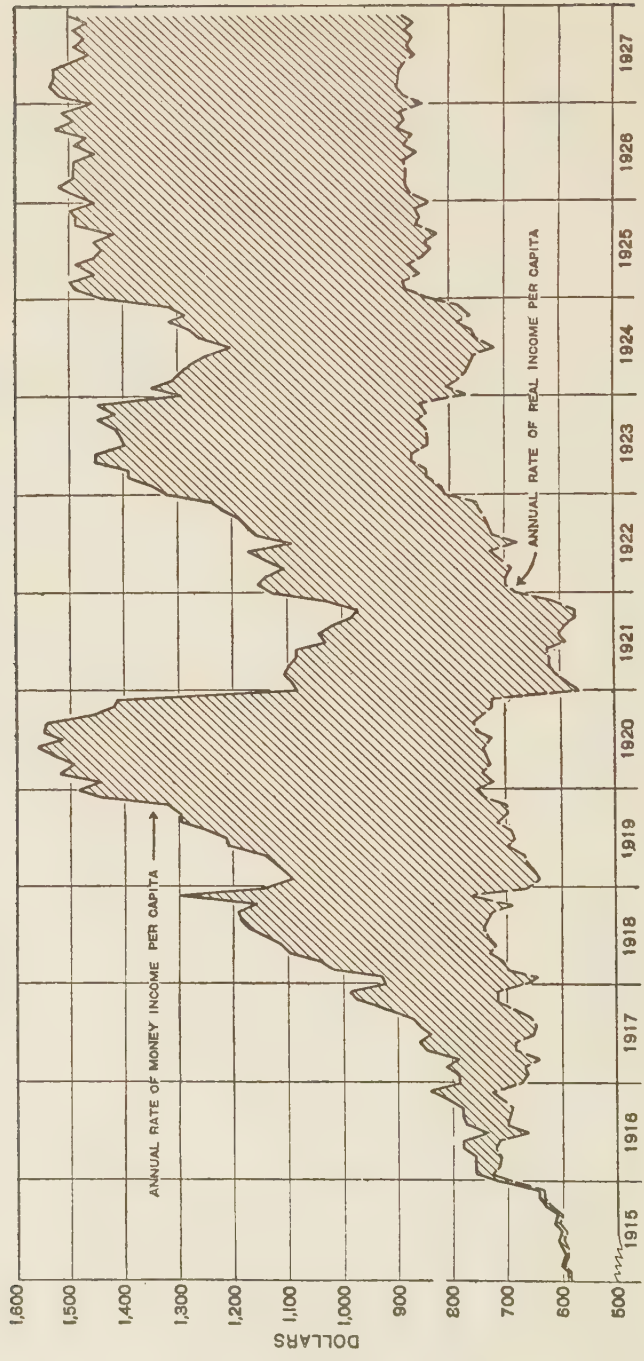


FIG. 9.—ESTIMATED ANNUAL RATES OF MANUFACTURING LABOR INCOME, PER CAPITA, BY MONTHS, JANUARY, 1915, TO DECEMBER, 1927

SUMMARIES FOR CENSUS YEARS

The remainder of the summary tables presented in this chapter contain data for census years only. Table 23 gives us a very brief summary of per capita annual earnings through the period covered in this monograph. It includes for the sake of comparison, not only the items which are for us of real importance—that is to say, the amounts and relatives of actual earnings—but it also includes amount and relatives of full-time earnings, both nominal and real. The purchasing power of full-time earnings is a concept only a shade less nebulous than that of nominal full-time earnings, which are doubly metaphysical. About full-time real earnings, at least this may be said: They represent the maximum point to which the purchasing power of given wage rates may rise when those wage rates are paid on a yearly basis

TABLE 23.—SUMMARY OF ESTIMATED ANNUAL EARNINGS, PER CAPITA, IN MANUFACTURING INDUSTRIES: 1899–1927

YEAR	ESTIMATED ANNUAL EARNINGS IN DOLLARS OF—				INDEX NUMBERS OF ESTIMATED ANNUAL EARNINGS			
	Purchasing power of the given year		1914 purchasing power		In current dollars		1914 purchasing power	
	Full-time	Actual	Full-time	Actual	Full-time	Actual	Full-time	Actual
	Absolute amounts				1914=100			
1899	$525	$446	$787	$669	$73	$77	$109	$116
1904	590	483	792	648	82	84	110	112
1909	643	557	690	598	89	97	96	104
1914	719	576	719	576	100	100	100	100
1919	1,433	1,212	818	692	199	210	114	120
1921	1,462	1,047	814	583	204	182	113	101
1923	1,566	1,317	927	839	218	229	129	146
1925	1,582	1,402	931	825	220	243	130	143
1927 [1]	1,612	1,373	943	805	224	238	131	140

[1] The complete results of the biennial census of manufactures for 1927 are not yet available. The figures are preliminary estimates constructed as explained on p. 413.

or there is virtually no unemployment. In such circumstances fluctuations in full-time real earnings come close to representing changes in earnings actually received. But it is with the second and fourth columns that we are primarily concerned and in those two columns, let it be repeated, it is the relatives (in the lower part of the table) rather than the absolute amounts that can be accepted with the most confidence.

In Table 24 a comparison is made between the nominal and real amounts both of earnings per capita and of the per capita value added by manufacture. This monograph is concerned primarily with earnings. No attempt is made to make comparisons between the estimated earnings derived from the census data and other and supplementary material, such as the census data on capital invested,

value of products, value added by manufacture, etc. The census figures for the amounts of value added by manufacture are obtained by subtracting from the value of products as reported by the establishments the cost of materials used in the fabrication of those products. The figures thus obtained are those which the census reports as "value added by manufacture." In Table 24 the amounts of value added by manufacture reported for the different census years are divided by the average number of wage earners in those years; the result is the money "value added" per capita of wage earners, as shown in the fourth column. We can get the most significant comparison by deflating not only money earnings but also money amounts of value added. The latter, however, have not been deflated by the index of the cost of living, but by the index of wholesale prices of manufactured products given in the next to the last

TABLE 24.—PER CAPITA EARNINGS AND PER CAPITA VALUE ADDED BY MANUFACTURE; UNITED STATES, ALL INDUSTRIES: 1899–1925

CENSUS YEAR	ABSOLUTE AMOUNTS				RELATIVES (1914=100)					
	Money earnings	"Real" earnings (at 1914 price level)	Money "value added"[1]	"Real" value added[2] (1914 price level)	Money earnings	Cost of living	"Real" earnings (at 1914 price level)	Money "value added"	Wholesale price index[3]	"Real" value added[2] (1914 price level)
1899	$446	$603	$1,025	$1,319	77	0.74	105	73	0.777	94
1904	483	582	1,151	1,346	84	.83	101	82	.855	96
1909	557	640	1,289	1,332	97	.87	111	92	.968	95
1914	576	576	1,404	1,404	100	1.00	100	100	1.000	100
1919	1,212	677	2,757	1,297	210	1.79	118	196	2.125	92
1921	1,047	595	2,639	1,805	182	1.76	103	188	1.462	129
1923	1,317	839	2,945	2,009	229	1.69	146	210	1.466	143
1925	1,402	825	3,194	2,022	243	1.70	143	227	1.580	131

[1] Per capita of manufacturing wage earners.
[2] Figures are quotients obtained by dividing amounts of value added by manufacture by average number of wage earners. Census of Manufactures, 1923, p. 14.
[3] Per capita of manufacturing wage earners. Deflation is by wholesale-price index. U. S. Bureau of Labor Statistics Index of Wholesale Prices of Manufactured Products (70 price series); 1913 base shifted to 1914. Bull. 440, p. 29.

column of the table. The resulting figures in the last column are described as indicating real value added per capita and they are now in form for fair comparison with figures in the third column for real earnings per capita. The comparison is most easily made between the index numbers for these two series in the right-hand section of the table.

VARIATION BETWEEN INDUSTRIES

We have already seen something of the relations among the different industries as to the amounts of per capita earnings, particularly in connection with the discussion of Figure 1. The facts depicted on that chart, however, had to do entirely with the year 1919 and with money earnings. In Table 25 are given the median, decil, and extreme industry averages of real earnings in each census year from

1899 to 1925. The figures are based upon arrays of the 41 selected industries, made separately for each year according to the per capita amounts of real earnings in the industries. Thus, for 1899 the figure $888 is the per capita amount of earnings in the industry which had the highest per capita earnings; $414, at the other end of the scale, represents the per capita amount of earnings received in the industry where the per capita real earnings were lower than in any other industry. In the industry in which the median amount of earnings were received, those earnings amounted to $623 per capita. The decil amounts represent the per capita figures for those industries which divide their whole number of industries into 10 equal parts. If the decil amounts closely approximate the median, that fact is pre-

TABLE 25.—MEDIAN, DECIL,[1] AND EXTREME INDUSTRY—AVERAGES OF REAL EARNINGS, CENSUS YEARS: 1899–1925

[For male wage earners]

	REAL EARNINGS (IN "COMMODITY DOLLARS" OF 1914)							
	1899 [2]	1904	1909	1914	1919	1921	1923	1925 [3]
Highest average	$888	$837	$962	$802	$993	$1,006	$1,191	$1,242
Ninth decil	808	728	817	758	845	773	1,085	1,054
Eighth decil	770	706	771	695	793	753	984	984
Seventh decil	719	671	732	663	743	704	946	954
Sixth decil	658	624	702	641	706	662	898	892
Median	623	600	670	616	683	627	890	852
Fourth decil	604	582	652	591	660	599	810	806
Third decil	581	560	617	552	614	583	759	739
Second decil	551	523	593	532	597	559	740	676
First decil	493	483	549	511	559	497	663	642
Lowest average	414	458	490	458	484	422	560	575
All industries	603	582	640	576	677	595	839	825

[1] The decils are those points in the percentage scale of rise or fall in earnings which divide the whole number of recorded changes in earnings for each year into 10 equal groups.
[2] Only 39 industries used in 1899. "Automobiles, bodies and parts," and "Chemicals," not included.
[3] Only 39 industries used in 1925, "Mineral and soda waters" and "Liquors, malt," not being included.

sumptive evidence of a correspondingly high degree of uniformity in earnings among the industries. It is *conclusive* evidence only of a degree of uniformity among industries in respect to *average* earnings. That the degree of uniformity (or variability) in individual wage earners' incomes is measures by the concentration of decil averages about the median average certainly is not arguable unconditionally. Other things equal, the greater the concentration of decil about median averages, the greater the presumable uniformity in earnings.[8]

Thus we should interpret the figures for 1919 as follows: The wage earners in eight-tenths of the industries were employed by establishments in which the per capita earnings ranged between $559 and $845 per capita; the wage earners in four-tenths of the industries were em-

[8] See below, Ch. X.

ployed by establishments in which the per capita earnings ranged between $614 and $743. In 1925 the wage earners in four-tenths of the establishments received earnings ranging between $739 and $954. The series of medians running through from 1899 to 1925 of course constitutes another series of averages which indicate in a general way the trend of real earnings through the period. The general drift in respect to concentration of industries about the median industry is shown in Figure 10.

The industries occupying the high, low, and median positions in respect to per capita real earnings, in the several census years are as follows:

Census year	High	Median	Low
1899	Petroleum refining	Confectionery	Woolen and worsted goods.
1904	Glass	Brick and tile, terra-cotta, pottery, and fire-clay products.	Cotton manufacturers.
1909	Printing and publishing, newspapers and periodicals.	Automobiles	Lumber and timber products.
1914	Glass	Furniture	Do.
1919	Iron and steel, blast furnaces	Leather, tanned, curried and finished.	Mineral and soda waters.
1921	Printing and publishing, book and job.	Foundry and machine-shop products.	Smelting and refining, copper, lead, and zinc.
1923	do	Brick and tile, terra-cotta, pottery, and fire-clay products.	Tobacco, cigars, and cigarettes.
1925	Printing and publishing, newspapers and periodicals.	Confectionery	Do.

A similar arrangement of our data on the relative fluctuations in real earnings is made the basis of Table 26, which shows the medians and deciles of change in real earnings per capita from one census year to the next.

It appears from the figures that in the interval between 1899 and 1904 the median change was a decline in real earnings per capita of 4.8 per cent. Between 1904 and 1909 they rose 10.3 per cent; between 1909 and 1914 they declined 8.2 per cent; between 1914 and 1919 they rose 9.3 per cent; between 1919 and 1921 they fell 4.1 per cent; between 1921 and 1923 they rose 30.9 per cent; and between 1923 and 1925 they fell 0.7 per cent. But the maximum, minimum, and decil figures above and below the median for each intercensal interval show how widely different was the behavior of real earnings in different industries. The period from 1919 to 1921 for manufacturing industries generally marked a serious decline, a decline which would be still more pronounced if we had annual census figures and could show the change from 1920 to 1921.[9] In this period the industry

[9] For interpolated annual estimates, see Table 109, p. 219.

in which there was the greatest fall in per capita earnings, the iron and steel industry, experienced a fall in such earnings of 39.5 per cent; yet in this same period there was evidently one industry (newspaper printing and publishing) which prospered sufficiently, so far as its wage earners were concerned, to show an increase of 33.4 per cent in real earnings, and in five industries per capita earnings increased in

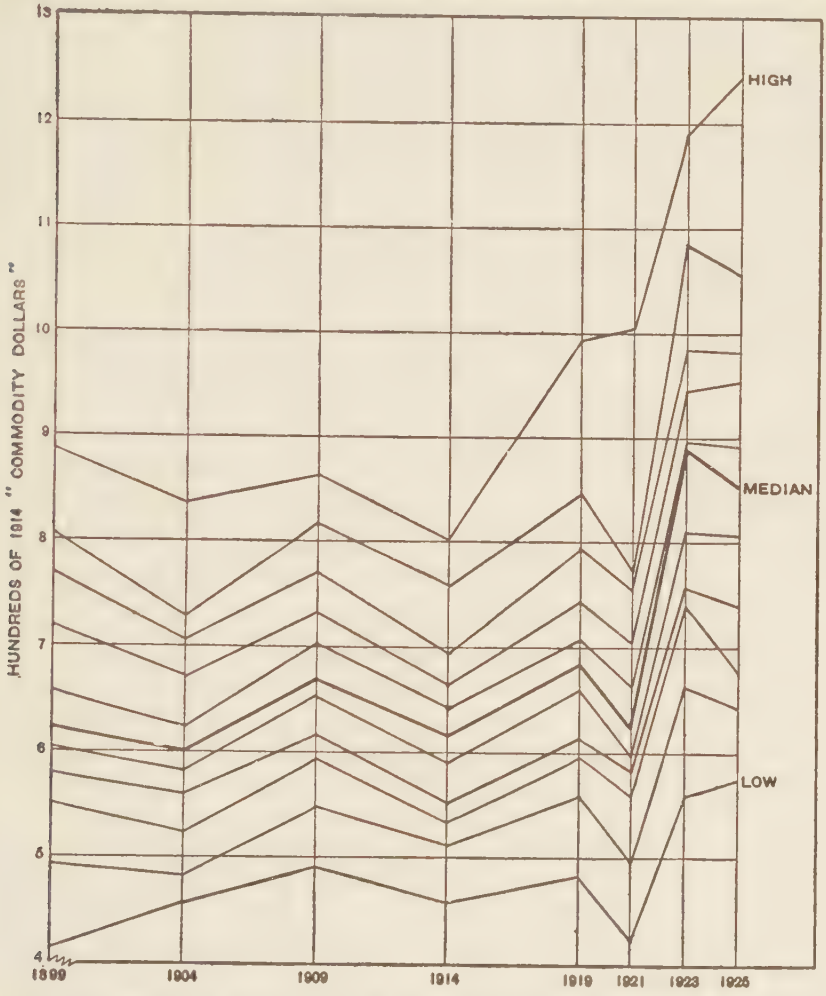


FIG. 10.—MEDIAN, DECIL, AND EXTREME INDUSTRY AVERAGES OF REAL INCOME PER CAPITA, 1899–1925

this period of depression, in proportions running between 11.1 per cent and 33.4 per cent. However, the tendency of the bulk of manufacturing industries in 1919–1921 is indicated by the statement that the wage earners in six-tenths of the industries experienced changes in real earnings ranging between increases of 8.4 per cent and declines of 19.2 per cent. Unfortunately, the changes indicated in this table

are somewhat inconclusive, because they represent not continuous but intermittent time series. The change in each case is not a net change; that is to say, changes between 1899 and 1900, 1900 and 1901, 1901 and 1902, 1902 and 1903, 1903 and 1904, may belie the apparent drift of census-year-to-census-year change indicated in the table for the 5-year period 1899–1904. That such year-to-year changes do alter the situation to some extent is evident from the data showing the year-to-year variability of the 12 separate industries for which intercensal estimates could be made.[10] Nevertheless, the picture given of the changes from census year to census year in Table 26 is not misleading in any serious way; it shows the general drift of change in earnings and the range of difference between industries in respect to that change. The data of the table are put in graphic form in

TABLE 26.—MEDIANS AND DECILS[1] OF CENSUS YEAR TO CENSUS YEAR INDUSTRY CHANGES IN PURCHASING POWER OF ACTUAL ANNUAL EARNINGS, PER CAPITA: 1899–1925

[Based on arrays of the 41 selected industries]

	PER CENT						
	1899–1904	1904–1909	1909–1914	1914–1919	1919–1921	1921–1923	1923–1925
Greatest rise	21.7	27.6	10.0	46.0	33.4	85.8	8.3
Ninth decil	12.0	16.8	2.2	28.6	11.1	66.2	6.6
Eighth decil	1.6	13.8	−1.7	22.1	8.4	50.8	3.8
Seventh decil	−.3	12.9	−3.8	17.4	5.7	42.0	.9
Sixth decil	−2.6	11.7	−6.5	11.8	2.6	35.6	−.6
Median	−4.8	10.3	−8.2	9.3	−4.1	30.9	−1.6
Fourth decil	−6.3	9.5	−9.7	7.9	−7.8	26.7	−3.8
Third decil	−7.1	7.3	−10.5	2.2	−14.2	20.7	−5.8
Second decil	−8.4	3.3	−12.6	−1.1	−19.2	18.1	−9.1
First decil	−12.3	−2.3	−14.7	−4.1	−22.6	15.0	−11.5
Greatest fall[2]	−20.5	−12.5	−17.5	−12.1	−39.5	3.9	−27.3
All industries (average)	−3.5	10.0	−10.0	17.5	−12.1	41.0	−7.1

[1] The decils are those points in the percentage scale of rise or fall in earnings which divide the whole number of recorded changes in earnings for each year into 10 equal groups.
[2] Or, as between 1921 and 1923, the smallest rise.

Figure 11. The diverging lines for each census year are drawn on a semilogarithmic scale, so that their slope is proportionate to the degree of change indicated by the data. The dots marking the ends of each series of diverging lines mark the median, decil, high and low industry cases of change in real earnings, so that the segment between the extreme points of each of the vertical lines represents the whole number of industries covered. The smaller segment between the two sloping lines, respectively, just above and just below the median line marks off the degrees of change experienced by two-tenths of the industries. In 8 of the 41 industries, in other words, real earnings changed by percentages which Table 26 shows to have been, for 1921–

[10] See Table 109 and fig. 28, based thereon.

1923, between plus 26.7 and plus 35.6. Similarly, the dots next but one to the top and bottom mark off changes in real earnings experienced by the wage earners in eight-tenths of the industries. In other words, using the period 1904 to 1909, for example, wage earners in three-tenths of the industries worked in establishments where per capita earnings underwent increases of between 12.9 and 27.6 per cent; in half of the 41 industries the wage earners experienced per capita changes in earnings ranging between increases of 10.3 per cent and declines of 12.5 per cent and another half of them benefited by increases in real earnings ranging between 10.3 and 27.6 per cent.

The industries occupying the high, median, and low positions in respect to percentage changes in per capita real earnings in the several census periods are as follows:

Census period	Greatest rise	Median change	Greatest fall (or least rise)
1899–1904	Brick and tile, terra-cotta, pottery, and fire-clay products.	Cars, steam-railroad, not including operations of railroad companies.	Petroleum refining.
1904–1909	Rubber tires and inner tubes, and rubber goods, not elsewhere specified.	Brick and tile, terra-cotta, pottery, and fire-clay products.	Glass.
1909–1914	Automobiles	Paper and wood pulp	Foundry and machine-shop products.
1914–1919	Iron and steel, blast furnaces	Bread and other bakery products.	Liquors, malt.
1919–1921	Printing and publishing, newspapers and periodicals.	Cotton manufactures	Iron and steel, steel works and rolling mills.
1921–1923	Iron and steel, steel works and rolling mills.	Paper and wood pulp	Flour-mill and gristmill products.
1923–1925	Automobile bodies and parts.	Shipbuilding, steel	Leather, tanned, curried, and finished.

The data of Figure 11, it should be noted, are plotted on a semi-logarithmic scale without fixed base and in each case the point of departure for measuring the change from one census year to the next is taken to be the median for the earlier year.[11]

Changes in per capita real earnings among the selected industries during the whole 27-year period, the pre-war part of the period and the war and postwar parts of the period are shown in Table 27. In order to facilitate the interpretation of these changes, two additional columns of data are thrown alongside. They show (in 1914 commodity dollars) the estimated average amounts of real earnings of male wage earners, in the first and last years, respectively, of the 27-year period. Those among the industry averages which are higher than the corresponding averages for all manufacturing industries combined are set in bold-faced type. The industries are arranged in this table in the order of the degree of change in per capita real earnings between 1899 and 1925, beginning with the industry which

[11] In the construction of this chart and the table upon which it is based, and in the construction of similar tables in a later chapter, the writer has in general followed the method used by W. C. Mitchell in portraying fluctuations in general prices. United States Bureau of Labor Statistics Bull. 284. Index numbers of wholesale prices in the United States and Foreign countries, pp. 14 to 16.

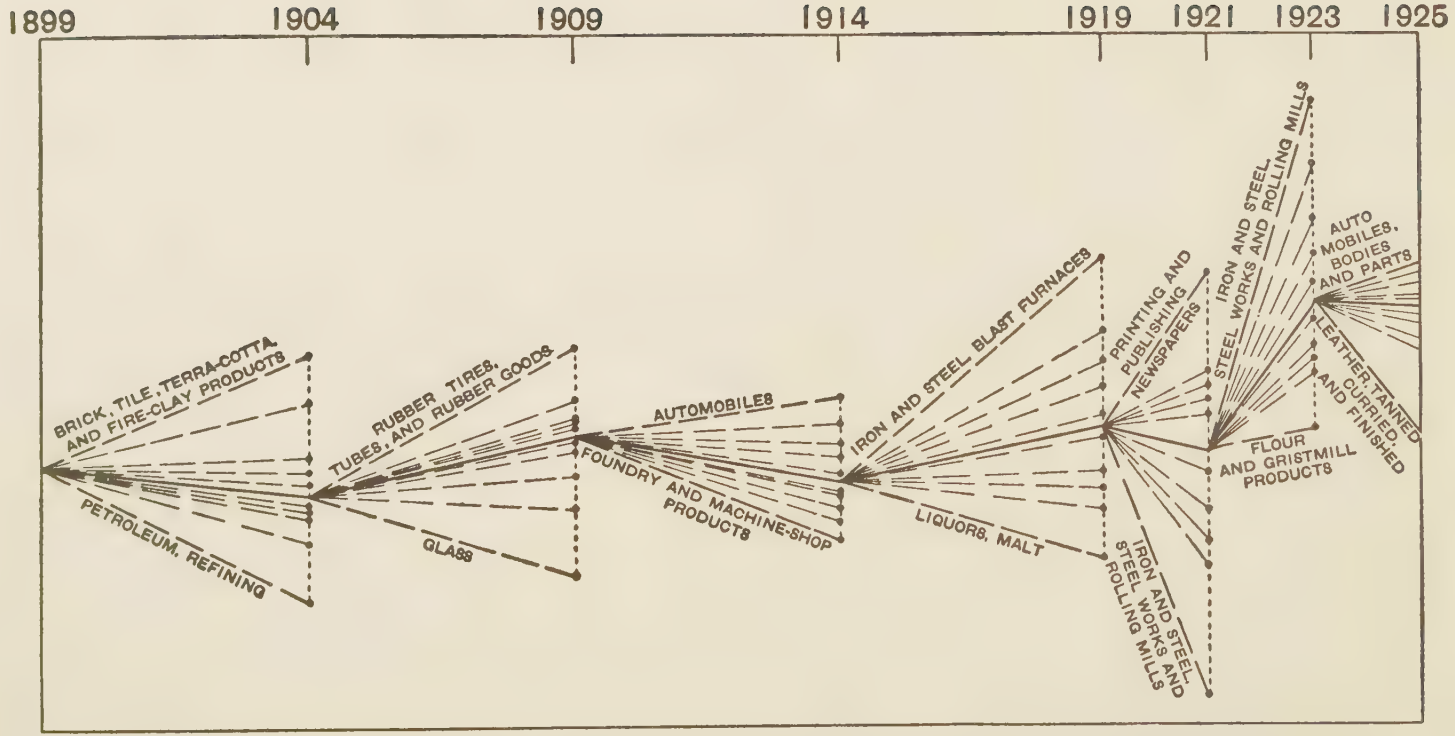


FIG. 11.—CONSPECTUS OF CENSUS YEAR TO CENSUS YEAR INDUSTRY CHANGES IN REAL INCOME, PER CAPITA, 1899–1925

shows the maximum change. It does not appear from these percentages that the greatest increases in real earnings have occurred, in industries which, in 1899, had levels of average earnings which were low compared with manufacturing industry as a whole. Yet there are a few striking exceptions, notably the brick, tile, and terra-cotta industry, and the automobile bodies and parts industry. The former shows the largest increase in (real) earnings of all the 41 industries—an increase of 80 per cent—and, in respect to the absolute level of its average real earnings, it stood, in 1899, almost at the bottom of the list. It will be noticed also that these two industries achieved large gains in the pre-war period as well as during the years following 1914; in this latter period more than half of the industries suffered losses in real earnings. In sharp contrast with this pre-war record is that of the decade beginning with the year 1914. Thirty-nine of the 41 industries achieved gains in per capita real earnings, the gains ranging from 2 to 80 per cent. The shirt industry stood in 1925 exactly where it was in 1899; smelting and refining dropped 1 per cent.

It is not without significance that most of the industries at the bottom of the list in Table 27, industries which experienced either net declines or very small gains in real earnings over the 27-year period, are manufacturing groups in which wage levels were relatively high in 1899. There are a few exceptions—mineral and soda waters, flour and grist mill products and, most noticeable of all, tobacco. The last-named industry showed an increase of only 2 per cent in real earnings, and yet its level of real earnings in 1899 was low—$596 as compared with $603 for all manufacturing combined. The result of tobacco's heavy decline from an initial (1899) level already low has been to bring the industry in 1925 quite to the bottom of the list.[12]

It appears from an examination of the dollar amounts in Table 27 that in respect to their earnings *rank* in 1899 and 1925 nearly half of the industries remained stationary or nearly so.[13] In this stationary group, if an industry ranked high in 1899 in respect to its level of average earnings, it ranked high in 1925. It is obvious that there may be considerable changes in earnings in an industry and, concurrently, little or no change in rank. Thus, in lumber and timber products average real earnings increased from $468 in 1899 to $662 in 1925, 41 per cent; the industry's *rank* in respect to earnings was, in 1899, fortieth, in 1923, thirty-sixth, in the list of 41 industries. It is also obvious that an industry in which occurred little or no change in earnings in the quarter-century is likely to have fallen considerably in its earnings rank.

[12] It is to be remembered that the dollar sums referred to in this discussion of the data of Table 27 represent estimates of the earnings of male wage earners only, expressed in dollars of the same purchasing power as the dollar of 1914.

[13] In the stationary group have been included all the industries whose rank was the same in 1925 as in 1899, or within 5 points of the same position.

TABLE 27.—CHANGES IN PURCHASING POWER OF MANUFACTURING LABOR INCOMES, PER CAPITA,[1] BY INDUSTRIES, 1899–1925, 1914–1925, 1899–1914; AND CORRESPONDING PER CAPITA AMOUNTS, 1899 AND 1925.

[Male wage earners]

ESTIMATED AMOUNTS OF REAL EARNINGS, PER CAPITA (DOLLARS)		INDUSTRY	PER CENT OF CHANGE IN REAL EARNINGS		
1899	1925		1899–1925	1914–1925	1899–1914
493	884	Brick and tile, terra-cotta, and fire-clay products	80	56	15
591	1,054	Rubber tires and inner tubes, and rubber goods, not elsewhere specified	78	60	11
688	1,219	Automobiles (motor vehicles)	77	65	7
[3] 507	877	Automobiles, bodies and parts	[3] 73	45	[3] 19
634	1,020	Furniture	61	66	−3
777	1,242	Printing and publishing, newspapers and periodicals	60	56	3
607	954	Lumber and planing-mill products	57	53	3
793	1,202	Printing and publishing, book and job	52	54	−2
414	615	Woolen and worsted goods	49	29	15
604	887	Paper and wood pulp	47	44	2
646	948	Iron and steel, blast furnaces	47	39	5
731	1,074	Clothing, women's	47	42	4
612	895	Carpets and rugs, other than rag	46	64	−11
750	1,074	Clothing, men's	43	45	−1
468	662	Lumber and timber products	41	45	−2
770	1,074	Iron and steel, steel works and rolling mills	39	60	−13
658	915	Silk goods	39	38	1
528	730	Knit goods	38	37	1
603	825	All industries	37	43	−4
623	852	Confectionery	37	33	3
493	671	Cars, steam-railroad	36	25	9
547	745	Shipbuilding, steel	36	34	2
562	748	Electrical machinery, apparatus, and supplies	33	46	−9
581	764	Bread and other bakery products	32	29	2
558	724	Agricultural implements	30	24	5
495	642	Cotton manufactures	30	29	0
797	1,013	Foundry and machine-shop products	27	50	−15
[3] 643	813	Chemicals	[3] 26	27	0
577	712	Leather, tanned, curried, and finished	24	34	−8
664	825	Slaughtering and meat packing	24	35	−8
719	875	Railroad repair shops—steam	22	37	−11
551	[4] 663	Mineral and soda waters	[5] 20	[5] 30	−7
623	720	Dyeing and finishing, textiles	16	30	−11
808	[4] 924	Liquors, malt	[5] 14	[5] 16	−2
858	971	Glass	13	21	−7
811	892	Railroad-repair shops—electric	10	36	−19
584	639	Flour-mill and gristmill products	9	16	−6
888	957	Petroleum refining	8	28	−16
742	788	Boots and shoes, not including rubber boots and shoes	6	13	−6
596	606	Tobacco, cigars and cigarettes	2	15	−11
643	642	Shirts	0	8	−8
688	682	Smelting and refining, copper, lead, and zinc	1	10	−10

[1] That is, average, per male wage earner attached to the respective industries.
[3] 1904.
[5] From 1904.
[4] 1923.
[5] To 1923.

VARIATIONS BETWEEN STATES

State changes in real earnings from census year to census year are indicated in Table 28, which is constructed in the same way as Table 26. Its data are put into graphic form in Figure 12. It is evident that there has been scarcely less variation with respect to fluctua-

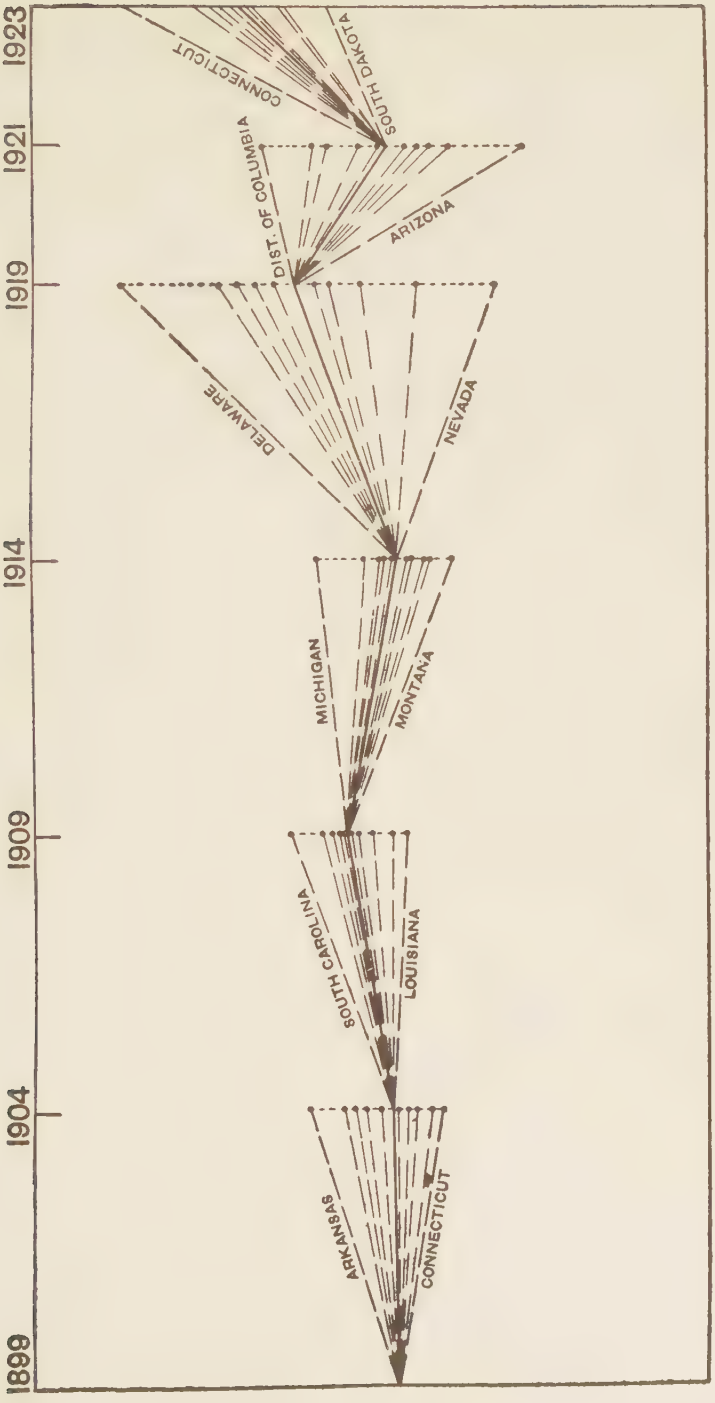


FIG. 12.—CONSPECTUS OF CENSUS YEAR TO CENSUS YEAR STATE CHANGES IN REAL INCOME PER CAPITA: 1899–1923

tions in real earnings among different States than between different industries. In the period from 1914 to 1919, for example, the median State change was a rise of 20 per cent, but in this same period the State showing the maximum rise experienced an increase in real earnings of 63.2 per cent. At the same time, in this period, when wage earners in industry generally were experiencing increases in the purchasing power of their earnings, in one-tenth of the States the per capita earnings of manufacturing wage earners declined between 3.3 per cent and 16.4 per cent. Nor is the fact unimportant that in the period from 1909 to 1914, when the median State change was a decline of 9.4 per cent, the wage earners in three-tenths of the industries experienced changes in real earnings ranging from a decline of 7 per cent to an increase of 6.2 per cent. A more detailed show-

TABLE 28.—MEDIAN, DECIL, AND HIGH AND LOW (CENSUS YEAR TO CENSUS YEAR) STATE CHANGES IN ANNUAL REAL EARNINGS, PER CAPITA: 1899–1923

[Based on arrays of the 49 States]

	PER CENT OF INCREASE OR DECREASE (−)					
	1899–1904	1904–1909	1909–1914	1914–1919	1919–1921	1921–1923
Greatest rise [1]	18.0	20.5	6.2	63.2	6.9	61.9
Ninth decil	10.5	13.6	−3.2	37.6	−1.4	42.6
Eighth decil	8.9	11.8	−6.0	32.6	−6.7	39.3
Seventh decil	6.3	10.7	−7.0	29.2	−13.3	36.4
Sixth decil	3.6	9.6	−8.4	24.6	−17.5	33.2
Median change	1.5	8.7	−9.4	20.0	−19.5	31.8
Fourth decil	1.2	8.1	−11.0	15.9	−22.4	30.6
Third decil	−1.0	7.0	−12.0	13.1	−23.8	28.4
Second decil	−2.3	3.9	14.1	6.8	−25.5	22.6
First decil	−5.1	−.1	−15.0	−3.3	−29.3	22.0
Greatest fall [2]	−7.1	−2.3	−18.7	−16.4	−40.6	12.6
United States (average)	−3.5	10.0	−10.0	17.5	−12.1	41.0

[1] Greatest rise: Arkansas, South Carolina, Michigan, Delaware, District of Columbia, Connecticut.
[2] Greatest fall: Connecticut, Montana (1904–1909 and 1909–1914), Nevada, Arizona, South Dakota.

ing in which the individual States and industries can be identified is made in Tables 27 and 30 and in Tables 103, 106, and 108 in Chapter IX.

Table 29 summarizes the State and industry changes reported in Tables 26 and 28, irrespective of the time element. It appears from the parallel distribution of State and industry changes, that there has been a very pronounced concentration of change in purchasing power in changes of relatively small degree. The great bulk of all the changes, whether they have been changes in respect to States or in respect to industries, have been either increases or decreases of less than 10 per cent. It is notable also that there is very little stability in the trend of real earnings—that is to say, there were no cases in which there was no change in real earnings between census

year and census year. This no doubt is partly due to the fact that series is an intermittent one; in Table 109 in Chapter IX, which reports year-to-year changes for 12 industries, several instances of no change in real earnings from one year to the next are in evidence.

Changes in the purchasing power of manufacturing labor income in the 48 States and the District of Columbia from 1899 to 1923, from 1914 to 1923, and from 1899 to 1914 are indicated in Table 30. This table presents data on real earnings in a form analogous to that used for the 41 industries in Table 27, on page 76, above. As in the industry table, the present one supplements the figures on percentages of change with figures showing for each of the 49 States the estimated amounts of per capita real earnings in 1899 and 1923. In the present table, however, these averages are for wage earners of all sex and age groups combined. All of the figures are based on the purchasing power of the dollar of 1914. Those among the State

TABLE 29.—COMPARISON OF 294 CASES OF STATE CHANGE IN "REAL" EARNINGS PER CAPITA WITH 283 CASES OF INDUSTRY CHANGE: 1899–1923

PER CENT OF CHANGE FROM PER CAPITA REAL EARNINGS OF PRECEDING CENSUS YEAR	DISTRIBUTION OF—		PER CENT OF CHANGE FROM PER CAPITA REAL EARNINGS OF PRECEDING CENSUS YEAR	DISTRIBUTION OF—	
	Industry changes	State changes		Industry changes	State changes
Total cases	283	294	Increases—Continued.		
			20–24.9	13	7
Increases:			15–19.9	17	11
85–89.9	1		10–14.9	23	14
80–84.9			5– 9.9	36	17
75–79.9			Under 5	31	27
70–74.9	2		Decreases:		
65–69.9	2		Under 5	40	46
60–64.9	1		5– 9.9	45	53
55–59.9	1	1	10–14.9	26	16
50–54.9	2		15–19.9	7	13
45–49.9	2	6	20–24.9	5	14
40–44.9	5	10	25–29.9	2	11
35–39.9	4	16	30–34.9	2	1
30–34.9	5	14	35–39.9	1	1
25–29.9	10	15	40–44.9		1

averages which are higher than the corresponding averages for the United States as a whole are set in bold-faced type. The States are arranged in the order of the degree of change in real labor incomes, per capita, between 1899 and 1923, beginning at the top with the State in which the greatest increase occurred.

It appears from these percentages that the largest increases in real earnings have occurred, almost without exception, in States which, in 1899, had levels of average earnings which were very low compared with the average for the whole country. The most impressive illustrations of this tendency are North Carolina and South Carolina, which are among the four leading States in respect to the degree of improvement in real earnings. It appears from the figures on the right that when the States are arranged in the order of diminishing *amounts* of per capita real earnings in 1899 these two States

trail all the rest. Possible exceptions to the tendency illustrated by the Carolinas are Michigan, Ohio, and the District of Columbia. Michigan's 1899 average, although slightly below that for the United States, overtops all of the other jurisdictions in the upper part of the table except Ohio and the District of Columbia. Michigan and Ohio, moreover, are the only States of major industrial importance that have achieved increases in real earnings, over the whole 25-year period, of more than 40 per cent. The 1899 average for the District of Columbia was slightly above the average for all States combined; from the fairly high per capita level represented by $607 the District experienced an increase of 42 per cent in the 25 years following, having a per capita level of 862 in the year 1923. No less than 23 of the States suffered declines in per capita earnings during the 15 years prior to the war. In marked contrast to this pre-war record is that of the decade 1914–1923; in this period each of the 49 States made gains in per capita real earnings, the increases ranging from 4 per cent in Arizona to 47 per cent in North Carolina. For the whole 25-year period, it will be noticed, there were two States—Arizona and Montana—which saw more or less serious declines in average labor incomes.

Turning to the large group of States in the lower section of the table, States which experienced less-than-average gains over the 25-year period, it is apparent that the 1899 per capita averages for the majority of them were well above the average for all States combined. This is most strikingly true of the States which, between 1899 and 1923, either suffered declines or made gains of 11 per cent or less. Of the 3 States at the foot of the list, Colorado made a gain of 1 per cent, the other 2 sustained losses of 5 and 10 per cent, respectively; these losses were the net resultant of the considerable losses between 1899 and 1914 and the less considerable gains between 1914 and 1923 made by both of them. There are some exceptions, States with quite low levels of per capita earnings in 1899, which yet failed to score any considerable gains. Virtually all of them are Southern States—Texas, Louisiana, Mississippi.

It appears from an examination of the dollar *amounts* in Table 30 that in respect to their earnings *rank* in 1899 and 1923 the majority of the States remained stationary, or nearly so. In other words, if a State ranked high in 1899 in respect to its level of average earnings, it is more than likely to be found in about the same rank in 1923.

Tables 31 and 32 present a synopsis of the amounts and relatives of hypothetical full-time, as well as actual, earnings classified according to large regional or industrial divisions. Table 31 gives the results for the Northeast, South, and West regions of the country; Table 32 for each of the six industrial divisions. The table, based on geographic divisions, shows very clearly the wide difference between

the Northeast, South, and West in regard to earnings, these amounts being much higher in the West and Northeast than in the South, and somewhat higher in the West than in the Northeast. As to relative changes in earnings, the situation is in general reversed; there has been more rapid change in the South than in the other divisions; the next most rapid change has occurred in the Northeast and the least rapid in the West. The South appears to be the only one of the three regions wherein there was a net increase in real

TABLE 30.—CHANGES IN THE PURCHASING POWER OF MANUFACTURING LABOR INCOMES, PER CAPITA, BY STATES, 1899–1923, 1914–1923, AND 1899–1914; AND CORRESPONDING PER CAPITA AMOUNTS, 1899 AND 1923

STATE	PER CENT OF CHANGE			ESTIMATED AMOUNTS OF REAL EARNINGS PER CAPITA		STATE	PER CENT OF CHANGE			ESTIMATED AMOUNTS OF REAL EARNINGS PER CAPITA	
	1899–1923	1914–1923	1899–1914	1899	1923		1899–1923	1914–1923	1899–1914	1899	1923
North Carolina	77	47	21	$247	$436	Delaware	29	44	−10	550	711
Michigan	72	41	22	577	991	California	29	26	3	750	971
Oklahoma	62	38	18	504	814	Tennessee	26	30	−3	427	539
South Carolina	61	32	22	249	401	Vermont	25	24	2	522	655
West Virginia	57	39	13	531	834	Rhode Island	25	35	−8	543	678
Alabama	44	35	7	409	591	New Hampshire	24	28	−3	522	646
Virginia	44	44	0	432	620	Idaho	24	11	12	818	1,017
Ohio	43	41	2	632	904	Arkansas	24	15	7	388	480
Dist. Columbia	42	47	−3	607	862	Florida	22	21	1	474	580
Kentucky	41	45	−3	489	689	Kansas	21	26	−4	636	767
United States	39	46	−5	603	839	Nebraska	21	17	3	641	773
						Minnesota	21	19	1	647	782
Maryland	38	36	1	493	679	Massachusetts	21	33	−9	584	704
Indiana	36	33	2	622	844	Washington	21	22	−1	783	949
New Jersey	36	50	−9	622	843	Missouri	20	23	−3	611	731
Maine	35	30	4	507	685						
Iowa	34	19	13	570	763	Texas	16	22	−5	561	848
						Mississippi	16	20	−3	401	467
Wyoming	33	45	−8	947	1,259	Louisiana	15	16	−1	485	555
Illinois	33	32	1	678	904	New Mexico	15	12	3	673	772
New York	33	43	−7	615	818	Utah	13	6	7	676	764
North Dakota	32	21	8	670	882						
Wisconsin	32	29	2	589	780	Nevada	11	14	−3	1,018	1,133
						South Dakota	7	8	−1	704	753
Georgia	31	23	7	316	414	Colorado	1	17	−14	870	878
Pennsylvania	31	44	−8	627	824	Montana	−5	9	−12	1,005	955
Oregon	30	21	7	677	877	Arizona	−10	4	−14	1,007	907
Connecticut	30	50	−13	631	821						

earnings between 1899 and 1921. But if 1923 be compared with 1899, net gains are shown in all three regions.

The figures in Table 32, which reports for the six industrial divisions the index numbers of nominal and real full-time earnings and of nominal and real actual earnings, show less marked differences than are evident between the three geographic regions. The two lower sections of the table are, of course, the more important, the lowest section, showing changes in actual, "real" earnings (i. e., purchasing power of actual earnings), being from the point of view of this monograph the most important of all. Comparing 1899 and

1919 it appears that in the metals and metal-products division, a gain of 10 points in real earnings was made during the 20-year period; there was an even larger increase in lumber and lumber products, the gain in this case being 13 points; and still greater gain in stone, glass, and chemicals, viz, 16 points, and in paper and printing 57 points. In textiles and leather there was a gain of 9 per cent; in food,

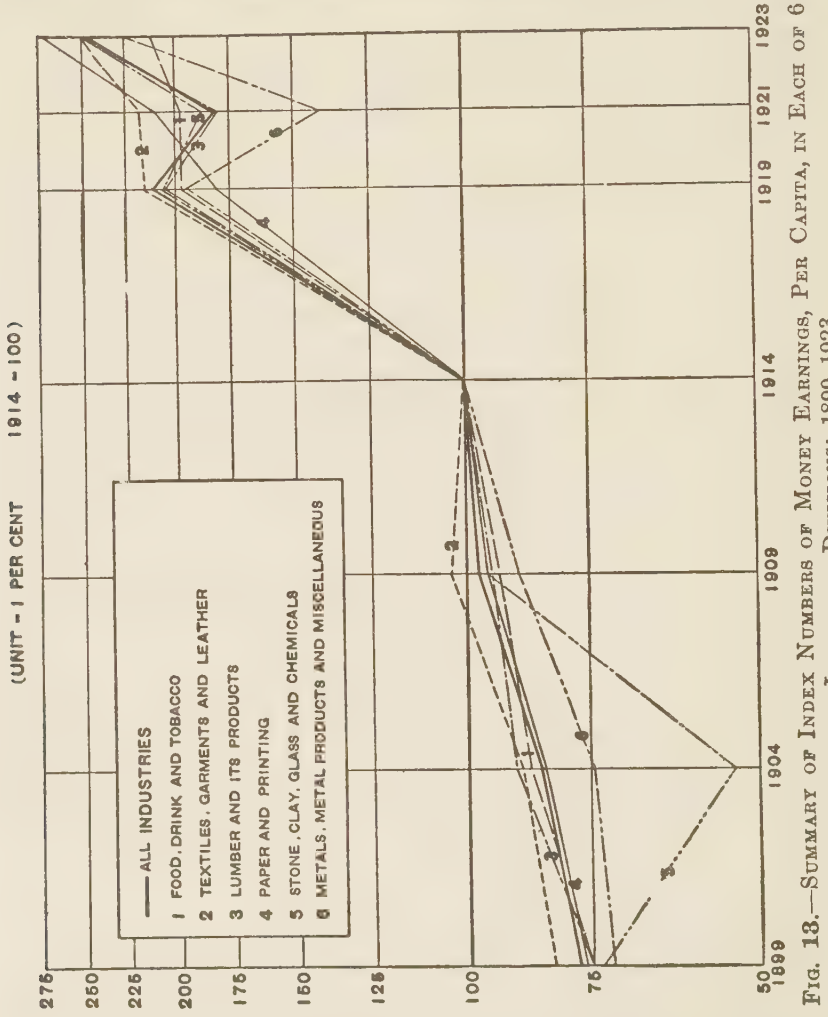


FIG. 13.—SUMMARY OF INDEX NUMBERS OF MONEY EARNINGS, PER CAPITA, IN EACH OF 6 INDUSTRIAL DIVISIONS: 1899–1923

drink, and tobacco one of 8 per cent; in paper and printing there was a net loss between 1899 and 1919 of 2 per cent, but in this case there was considerable recovery by 1921. Each of the six industrial divisions shows unprecedented gains between 1921 and 1923.

The index numbers of actual money earnings in Table 32 are plotted on a logarithmic scale in Figure 13. Again we note rather marked differences between industry groups, with an apparent tendency to wider variation in periods of depression.

A summary for sex and age groups of nominal and real, full-time and actual earnings is contained in Table 33. The most important feature here is the wide margins by which the earnings of women and children fall short of the earnings of men.

TABLE 31.—SUMMARY OF ANNUAL EARNINGS, PER CAPITA, IN MANUFACTURING INDUSTRIES, BY GEOGRAPHIC REGIONS: 1899–1923

CENSUS YEAR	ESTIMATED ANNUAL EARNINGS PER CAPITA					
	Hypothetical full-time			Actual time		
	Northeast	South	West	Northeast	South	West
	MONEY EARNINGS: AMOUNTS					
1899	$554	$371	$659	$457	$307	$579
1904	608	447	814	497	357	690
1909	663	478	887	572	403	795
1914	742	550	936	597	430	776
1919	1,472	1,163	1,612	1,385	959	1,412
1921	1,521	1,100	1,685	1,053	768	1,249
1923	1,692	1,105	1,701	1,431	975	1,594
	MONEY EARNINGS: RELATIVES					
1899	75	67	70	77	71	75
1904	82	81	87	83	83	89
1909	89	87	95	96	94	102
1914	100	100	100	100	100	100
1919	198	211	172	232	223	182
1921	205	200	180	176	179	161
1923	228	201	182	240	227	205
	"REAL" EARNINGS: AMOUNTS					
1899	749	501	891	618	415	782
1904	733	539	981	599	430	831
1909	762	549	1,020	657	463	914
1914	742	550	936	597	430	776
1919	822	650	901	774	536	789
1921	864	625	957	598	436	710
1923	1,001	654	1,007	847	577	943
	"REAL" EARNINGS: RELATIVES					
1899	101	91	95	104	47	101
1904	99	98	105	100	100	107
1909	103	100	109	110	108	118
1914	100	100	100	100	100	100
1919	111	118	163	130	175	102
1921	116	113	102	100	101	91
1923	135	119	108	142	134	122

VARIATION WITHIN SELECTED INDUSTRIES

Little need be said here concerning the results of the special examination of the 1919 establishment schedules in 20 industries, the results of which are reported in Chapters X and XI. The purpose was to ascertain the range of variation within each of the industries, if possible, and in the whole group of industries combined. The variation is expressed in brief form by the standard deviation,

which is the square root of the mean square of the deviations of the individual establishment per capita amounts of earnings from the corresponding per capita amounts for the industry. The standard

TABLE 32.—SUMMARY OF RELATIVES OF ESTIMATED ANNUAL MONEY EARNINGS, PER CAPITA, BY INDUSTRIAL DIVISIONS AND CENSUS YEARS: 1899–1923

[Index numbers for base year in bold-faced type]

CENSUS YEAR	All industries	Food, drink, and tobacco	Lumber and its products	Metals and metal products, including miscellaneous	Paper and printing	Stone, clay, glass, and chemicals, "mineral"	Textiles, garments, and leather
	INDEX NUMBERS OF ANNUAL PER CAPITA EARNINGS						
	HYPOTHETICAL FULL-TIME ("ANNUAL WAGE RATES"): NOMINAL						
1899	73	76	71	68	72	72	82
1904	82	84	86	74	81	50	90
1909	89	91	88	81	89	89	100
1914	**100**	**100**	**100**	**100**	**100**	**100**	**100**
1919	199	183	191	179	169	193	221
1921	204	199	185	180	208	207	235
1923	216	197	200	193	215	216	243
	HYPOTHETICAL FULL-TIME ("ANNUAL WAGE RATES"): "REAL"						
1899	99	103	96	92	97	97	111
1904	99	101	104	89	98	60	108
1909	103	105	101	93	102	102	115
1914	**100**	**100**	**100**	**100**	**100**	**100**	**100**
1919	111	102	107	100	94	108	123
1921	116	113	105	102	118	118	134
1923	129	117	118	114	127	128	144
	ACTUAL TIME: NOMINAL						
1899	77	75	75	71	76	73	82
1904	84	86	89	74	83	53	88
1909	97	92	94	88	95	95	103
1914	**100**	**100**	**100**	**100**	**100**	**100**	**100**
1919	210	196	204	190	181	205	214
1921	182	197	181	140	208	186	219
1923	243	209	244	224	271	244	260
	ACTUAL TIME: "REAL"						
1899	105	101	101	96	103	99	111
1904	101	104	107	89	100	64	106
1909	111	106	108	101	109	109	118
1914	**100**	**100**	**100**	**100**	**100**	**100**	**100**
1919	118	109	114	106	101	115	120
1921	103	112	103	80	118	106	124
1923	146	124	144	133	160	144	148

deviation measures the concentration of the group about the average, indicating what is for any industry the typical deviation. When this typical deviation, which in the present case is a sum of money in dollars, is divided by the average earnings the ratio so obtained (the coefficient of variation) indicates in a form which makes it com-

parable with similar coefficients for other industries, the degree of variation of wages in the several industries. The coefficient of variation, in other words, is the ratio of the standard deviation in earnings to the average earnings, multiplied by 100.

The coefficient of variation for the 20 industries selected as samples was 33.6. The standard deviation from the average of $1,272 for the 20 industries combined is $427. The range of variation among the 12 industries for which it was worked out separately is exceedingly wide, running from a minimum to 11.7, the coefficient for the automobile industry, to 89.3, the coefficient of the newspaper

TABLE 33.—SUMMARY OF ESTIMATED AMOUNTS OF EARNINGS, PER CAPITA, IN THE UNITED STATES, ALL INDUSTRIES COMBINED, BY SEX AND AGE GROUPS, CENSUS YEARS: 1899–1923

SEX, AGE GROUP, AND TYPE OF PER CAPITA EARNINGS	1899	1904	1909	1914	1919	1921	1923
All groups:							
Full-time earnings—							
Nominal	$525	$590	$643	$719	$1,423	$1,402	$1,548
Real	710	711	739	719	801	831	927
Actual earnings—							
Nominal	446	483	557	576	1,212	1,047	1,401
Real	603	582	640	576	677	595	839
Men:							
Full-time earnings—							
Nominal	587	659	729	804	1,601	1,634	1,726
Real	793	794	838	804	894	928	1,021
Actual earnings—							
Nominal	498	540	631	644	1,354	1,170	1,562
Real	673	651	725	644	756	665	924
Women:							
Full-time earnings—							
Nominal	314	353	391	430	858	875	926
Real	424	425	449	430	479	497	547
Actual earnings—							
Nominal	267	289	339	344	726	627	837
Real	361	348	390	344	406	356	495
Children:							
Full-time earnings—							
Nominal	179	200	222	244	487	497	526
Real	242	241	256	244	272	282	311
Actual earnings—							
Nominal	152	164	192	195	412	356	475
Real	206	198	221	195	195	280	281

printing and publishing industry. Between the eight cities included in the inquiry there were wide differences in the degree of variation in earnings; but it is distinctly less as between industries. The cities wherein the coefficient of variation was lowest was Detroit, where the coefficient was 20.3, this low variation being undoubtedly due to the predominance of the automobile industry—an industry which has apparently an unusually high degree of uniformity in earnings.

The city having the greatest variation in earnings is New York, where the coefficient is 40.1. The comparisons made in Chapter XI between the variability of wages in 1899 and 1919 indicate a decline in variability. The 1899 figures are taken from Mr. Henry L. Moore's

study [14] which is in turn based on Mr. Davis R. Dewey's census report on Employees and Wages.[15] Mr. Moore's coefficient of variation for 30 industries in 1899 is 43.5, a coefficient which, it should be noted, is based on variation in rates and not on variation in earnings, as compared with the present coefficient of 33.6 for 1919, based on earnings in 20 industries in seven large cities. Mr. Moore found there had been a slight decrease in variability between 1890 and 1900. The change since the latter date, however, has evidently not been one of continuous decline.[16] The coefficient of variation based on earnings in 33 industries reported in the special investigation of average weekly earnings in 1904 indicated that there had been an increase in the rate of decline in variability between 1899 and 1904, the coefficient for the latter year being 30.6. It would appear, then, that since 1904 there has been a slight but appreciable increase in the variability of earnings. However, the smallness of the basis on which the 1919 coefficients have been calculated is probably sufficient reason for declining to take the 1919 results as more than tentative estimates.

[14] "The variability of wages" 22 Political Science Quarterly, 67 (1907).
[15] Employees and Wages, by Davis R. Dewey. Special reports of the Twelfth Census.
[16] See Table 125, p. 248.

Part II

ESTIMATED AMOUNTS OF PER CAPITA EARNINGS

Chapter III

ACTUAL AND FULL-TIME MONEY EARNINGS

This and the three following chapters deal with estimated dollar amounts of earnings. They have nothing whatever to do with relative fluctuations in earnings, which are discussed in Part III. Some cautions are necessary at the outset: The amounts reported are estimated amounts. This qualification must be borne carefully in mind; indeed it must be confessed at the outset that the results here presented, which purport to show amounts of per capita earnings, as contrasted with relative changes in earnings, are subject to a margin of error which, while it has not been possible to measure it closely, is probably all too large, certainly larger than is the case with *changes* in earnings. Although the precise degree of error can not be measured accurately, it is possible to identify some of the different channels through which errors may easily have crept into the analysis.

SOURCES OF ERROR

All of the estimates of amounts of earnings are derived, in the first place, from reported amounts of average weekly earnings, presented in Census Bulletin 93 for the busiest week in the year 1904, as explained in Chapter XIV. The first step in the attempt to arrive at the amount of average annual earnings is to expand, by use of an unemployment correction factor, the averages of weekly earnings in Census Bulletin 93 to estimated amounts of full-time weekly earnings. Obviously, some error may enter at this point because of inaccurate estimates as to the amount of unemployment among those attached to each industry in the week of 1904 which was the busiest week for that industry.

The next step, which consists in multiplying these full-time weekly earnings figures by 51, to get an estimate of full-time annual earnings, involves possibilities of some error, but it is not believed in this case to be serious. Having estimated amounts of average annual earnings for 1904, the corresponding annual averages for other census years, prior and subsequent to 1904, are derived by application, to the 1904 item, of the curve of change made up of index numbers of census average wages,[1] which, it is believed, very faithfully reflect *changes* in full-time annual earnings. To the extent that this assumption is correct there is little or no error involved in passing in this way

[1] See initial paragraph, Ch. XIII, p. 269.

from the estimate of full-time annual earnings for 1904 to similar estimates for other census years; to the extent that this assumption is invalid there may be appreciable error in the amounts for the other census years.

The procedure just described covers all of the steps involved in arriving at estimates of full-time annual earnings. But the expression "full-time annual earnings" being almost a flat contradiction in terms, it is necessary to take the additional step (the final one so far as money earnings are concerned) of discounting these full-time amounts with a unemployment correction ratio (which will be referred to in these pages as the "fraction of full employment" or the "ratio of actual to full employment").[2] It is quite clear from the rather involved analysis by which these ratios of actual to full employment are derived, that there is in this process of cutting full-time down to actual earnings, a source of what may be very considerable error; certainly the cumulation of the possible errors in the preceding steps, in their effect upon the final estimates of actual money earnings per capita, may be so large as seriously to impugn the value of these estimates. Empirical tests of these estimates, however, by comparison with such other estimates of money earnings per capita in corresponding industries as are available, seem to indicate that they are reasonably dependable.

The last step of all, so far as our estimates of amounts of per capita earnings are concerned, is that of deflating money earnings to real earnings, in order to facilitate comparisons of the purchasing power of earnings received by manufacturing wage earners at different periods of time. This process of deflation, which puts the earnings of pre-war years on a comparable basis with earnings of postwar years, is a possible source of additional error. The extent of this error depends, of course, upon the accuracy of the cost of living data utilized in this analysis. Fortunately it is possible, at any rate within any one geographic region, to use the same cost of living figures for all different industries; because there is, in the cost of living, nothing like the wide differences between industries that appear in connection with the amount of employment. It seems reasonable to conclude that there is no greater error contained in the figures for real earnings than in the corresponding figures for money earnings.

Probably the largest single source of error in the estimates of amounts of earnings, is the ratio of actual to full employment used to reduce full-time to actual earnings. As is more fully explained in Chapter XVI, there were two different series of ratios developed in the course of our search for a satisfactory series of fractions of full employment, to-wit, the series derived by Method A and the

[2] See Ch. XVI.

series derived by Method B. The ratios derived by Method A show in most industries much larger amounts of unemployment than do those of Method B. The margin of difference between the results of Method A and the results of Method B, for all industries combined, is about 18 per cent. The margin of difference between the amounts of unemployment shown in the different selected industries by the two methods, ranges from no difference at all in printing and publishing, to the other extreme represented by five industries in the miscellaneous group, where the margin of difference between the two series amounts to about 34 per cent. But neither Method A nor Method B was taken as a final estimate of the ratio of actual to full employment; the series of ratios finally determined upon was constructed by taking the arithmetic means of ratios derived by Methods A and B, respectively, for each of the different industry groups, and in a similar fashion ratios for geographic divisions were derived by striking an average between Methods A and B. It follows that the possible margin of error at this point, for all industries, may be very closely represented by the margins between the final ratio and the Method A ratio, which usually represents the minimum, on the one hand, and the Method B ratio, which usually represents the maximum, on the other hand. This margin of difference, for all industries combined, is 9 per cent and the range among the different industries runs from zero to 17 per cent.

The range in terms of dollars of per capita earnings between what may fairly be taken as representing the points, respectively, above which average wages can hardly have risen, and below which they can hardly have dropped, is indicated in Table 34, which shows for all industries combined and for each year, including intercensal years interpolated between 1899 and 1925, the final estimates of money earnings (in the center column) and on either side of it the maximum and minimum amounts calculated by Methods A and B, respectively.[3] It would appear from these figures, to take for illustration the figures for census years, that in 1899, the average earnings for all industries combined, could not have been less than $406 a year, or more than $486 a year. The final estimate as between these extremes is $446. In 1914 it would seem that average earnings must have fallen somewhere between $524 and $628, in 1919 between $1,103 and $1,321, and in 1925 between $1,276 and $1,528.

In using and interpreting the figures given in the tables in this and the following three chapters, the reader should be careful not to take the dollar sums reported as representing precise sums accurate to the last dollar of average earnings; that is to say, the units digit at the

[3] A similar comparison of high, low, and final estimates is made, for certain selected industries, in Table 13, p. 42, above.

extreme left in each item should be taken less seriously than the tens digit to the left of it and the latter digit less seriously than the digit still further to the left. For example, the estimated average of money earnings for all industries combined for 1923 is $1,317. This sum is probably fairly accurate to the nearest tens of dollars; certainly one would be rash to bet on its being accurate to the last dollar represented in the figure. The degree of accuracy which the figures presume to have would perhaps be better reflected if the last digit in each item were entirely dropped and the boxheading changed to read "Earnings per capita (in tens of dollars)."

TABLE 34.—HIGH, LOW, AND FINAL ESTIMATES OF ACTUAL ANNUAL MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, ALL INDUSTRIES COMBINED, EACH YEAR: 1899–1925

[Figures for census years in bold-faced type]

YEAR	ESTIMATES OF ACTUAL MONEY EARNINGS PER CAPITA			YEAR	ESTIMATES OF ACTUAL MONEY EARNINGS PER CAPITA		
	Minimum 9 per cent lower (Method A)	Final estimate	Maximum 9 per cent higher (Method B)		Minimum 9 per cent lower (Method A)	Final estimate	Maximum 9 per cent higher (Method B)
1899	**$406**	**$448**	**$486**	1913	$561	$617	$673
1900	409	449	489	1914	**524**	**576**	**628**
1901	**429**	**471**	**513**	1915	553	608	663
1902	452	497	542	1916	699	768	837
1903	453	498	543	1917	783	860	937
1904	**440**	**483**	**526**	1918	1,005	1,104	1,203
1905	488	536	584	1919	**1,103**	**1,212**	**1,321**
1906	517	568	619	1920	1,354	1,488	1,622
1907	527	579	631	1921	**953**	**1,047**	**1,141**
1908	451	496	541	1922	1,066	1,171	1,276
1909	**507**	**557**	**607**	1923	**1,198**	**1,317**	**1,436**
1910	509	559	609	1924	1,192	1,310	1,423
1911	486	534	582	1925	**1,276**	**1,402**	**1,528**
1912	539	592	645				

ACTUAL EARNINGS AND "FULL-TIME" EARNINGS

A general summary of the results of the estimates of the amounts of earnings for all industries combined, and with intercensal years interpolated, is given in Table 35 which shows on the left annual per capita earnings in current dollars, both hypothetical full-time and actual. On the right hand are shown corresponding figures representing the purchasing power (at the 1914 price level) of both hypothetical full-time and actual earnings. "Hypothetical full-time earnings" are inserted, not because they have any importance in themselves, but in order to reveal the very considerable absolute differences between the amounts of real earnings which would be received by the average wage earners were there no unemployment and no sickness or enforced or voluntary absence for other reasons, and the amounts which they are estimated actually to have received. As in the case of the undeflated figures, this margin between the two

series, though considerable at all times, varies widely as between periods of prosperity and succeeding periods of depression. In 1921, for example, actual real earnings were $595 per capita, according to the figures in Table 35, whereas full-time real earnings per capita, if there had been full-time employment for all attached to the manufacturing industries, would have been $831.

This chapter is concerned only with the type of earnings represented by the two columns at the left of Table 35; that is to say, with full-time and actual money earnings. A comparison is made between these two forms of money earnings in Table 36, which reports by sex and age groups for all industries combined and for each of the census years covered in the inquiry, the dollar amounts

TABLE 35.—ESTIMATED AMOUNTS OF ANNUAL EARNINGS, PER CAPITA, IN MANUFACTURING INDUSTRIES, IN THE UNITED STATES, EACH YEAR: 1899–1927

[Figures for census years in bold-faced type]

YEAR	ANNUAL EARNINGS PER CAPITA				YEAR	ANNUAL EARNINGS PER CAPITA			
	Nominal (current dollars)		"Real" (purchasing power at 1914 prices)			Nominal (current dollars)		"Real" (purchasing power at 1914 prices)	
	Hypothetical full-time	Actual	Hypothetical full-time	Actual		Hypothetical full-time	Actual	Hypothetical full-time	Actual
1899	**$525**	**$446**	**$710**	**$603**	1914	**$719**	**$576**	**$719**	**$576**
1900	544	449	716	591	1915	732	608	747	620
1901	552	471	708	604	1916	846	768	791	718
1902	566	497	708	621	1917	980	860	760	667
1903	579	498	789	593	1918	1,284	1,104	818	703
1904	**590**	**483**	**711**	**582**	1919	**1,433**	**1,212**	**801**	**677**
1905	602	536	725	646	1920	1,722	1,488	840	726
1906	626	568	728	660	1921	**1,462**	**1,047**	**831**	**595**
1907	650	579	714	636	1922	1,424	1,171	858	705
1908	643	496	739	570	1923	**1,566**	**1,317**	**927**	**839**
1909	**643**	**557**	**739**	**640**	1924	1,560	1,310	923	776
1910	654	559	711	608	1925	**1,582**	**1,402**	**931**	**823**
1911	662	534	697	562	1926	1,610	1,436	931	830
1912	684	592	713	617	1927	1,612	1,373	943	805
1913	712	617	719	623					

of per capita earnings. It is obvious enough from the figures in this table that the actual earnings received by the wage earner are lower by a wide margin than the corresponding earnings which he would have received if he had worked full time. Since there is seldom or never a time when all employees attached to industry are employed regularly throughout the year, it follows that full-time earnings throw little or no light upon the welfare of wage earners. The thing that is important to them and important, moreover, to anyone who is interested in the incomes of this section of the population, is the actual labor income received. The welfare and progress of the wage-earning classes are reflected in these figures on actual earnings. Full-time earnings are roughly equivalent to annual rates

of pay, and it is notorious that rates of pay, whether yearly or hourly, throw little light upon the amounts actually received in wages. Changes in rates, of course, other things being equal, produce corresponding changes in earnings, but rate changes constitute only one of the factors entering into earnings, another equally important one being the condition of business; that is to say, the extent of unemployment. Wage rates may remain the same and at the same time there may take place a reduction in employment and that brings about reductions in earnings despite the stability of rates. It is true that there are some industries, particularly those which are known to be relatively stable, such as the printing and publishing of newspapers, that run very steadily and in these industries full-time money earnings are less inadequate as indicators of the incomes of their wage earners than is true of most industries. Moreover, in manufacturing industries generally, it is true that figures for hypo-

TABLE 36.—ESTIMATED AMOUNTS OF FULL-TIME AND ACTUAL ANNUAL MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, BY SEX AND AGE GROUPS, CENSUS YEARS: 1899–1923

GROUP AND TYPE OF EARNINGS	1899	1904	1909	1914	1919	1921	1923
All groups:							
Full-time earnings	$525	$590	$643	$719	$1,433	$1,462	$1,548
Actual earnings	446	483	557	576	1,212	1,047	1,398
Men:							
Full-time earnings	587	659	729	804	1,601	1,634	1,726
Actual earnings	498	540	631	644	1,354	1,170	1,562
Women:							
Full-time earnings	314	353	391	430	858	875	925
Actual earnings	267	289	339	344	726	627	837
Children:							
Full-time earnings	179	200	222	244	487	497	525
Actual earnings	152	164	192	195	412	356	475

thetical full-time earnings have some value in indicating the maximum beyond which it is impossible for annual earnings to go without either a change in rates or a considerable amount of overtime. The other types of changes, which might allow of expansion in earnings, have been assumed to have had maximum play. If a worker got full-time earnings, in other words, there could have been no unemployment and no sickness involving loss of pay. Consequently, the only way in which full-time money earnings can be increased is by an increase in the rates of wages. It is with this idea of furnishing some such general notion of this essentially hypothetical, and probably unattainable, maximum per capita sum that we present the figures in Table 37 showing full-time earnings in each census year, classified according to geographic regions and divisions. There is evident in these figures, what will appear in all of our other regional classifications, namely: A wide difference between the Northeast, South, and West sections of the country, the amounts of earnings

being highest in the West, followed closely by the Northeast, and at a wide distance by the South, in which region the amounts of earnings run a very poor third and are far lower than in either of the other two regions.

Table 38 makes a comparison for each of the 41 selected industries of estimated amounts of actual and full-time money earnings.[4] It is evident upon inspection of the figures for the different selected industries that there is a wide variation in the margins by which actual earnings fall short of hypothetical full-time earnings. This variation is widest in periods of business depression like 1914 and 1921, but even in such periods it is evident that wage earners in such industries as printing and publishing suffered a very much smaller reduction in earnings because of unemployment than did their fellows in industries like the manufacture of steam-railroad cars. In that

TABLE 37.—ESTIMATED AMOUNTS OF FULL-TIME MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, BY GEOGRAPHIC REGIONS AND DIVISIONS, CENSUS YEARS: 1899–1923

REGION	1899	1904	1909	1914	1919	1921	1923
UNITED STATES	$525	$590	$643	$719	$1,433	$1,462	$1,545
NORTHEAST	554	608	663	742	1,472	1,521	1,692
New England	512	556	601	651	1,263	1,291	1,396
Middle Atlantic	553	601	655	709	1,474	1,509	1,774
East North Central	562	647	698	815	1,604	1,662	1,798
West North Central	552	635	686	775	1,371	1,555	1,511
SOUTH	371	447	478	550	1,163	1,100	1,105
South Atlantic	356	418	456	531	1,183	1,087	1,091
East South Central	391	471	480	551	1,125	1,078	1,111
West South Central	435	543	549	636	1,189	1,206	1,152
WEST	659	814	887	936	1,612	1,685	1,701
Mountain	742	883	892	971	1,546	1,713	1,661
Pacific	633	791	907	926	1,629	1,677	1,717

industry hypothetical full-time earnings in 1921 were $1,748, while estimated actual earnings were $869, less than one-half the hypothetical full-time average. Of course, even in periods of prosperity the stable industries show some unemployment, when we think of full employment involving, as it naturally should, the continuous employment of all the wage earners attached to the industry. Thus, in the prosperous year of 1919 even in the printing and publishing of newspapers the average wage earner received only $1,330 a year, whereas if he had been employed full time he would have received $1,442. In less stable industries in that year the situation is, of course, much worse. Thus in the automobile industry in 1919 hypothetical full-time earnings, or wage rates, were $1,739, while the average earnings estimated to have been actually received were $1,278. Other industries in that year of prosperity which reflect considerable deductions in earnings because of unemployment were

[4] The figures for actual earnings for 1919 are shown graphically in fig. 1, p. 36

electrical machinery, apparatus, and supplies; railroad repair shops; steel shipbuilding; woolen and worsted goods; and men's and women's clothing.

TABLE 38.—ESTIMATED AMOUNTS OF FULL-TIME AND ACTUAL ANNUAL MONEY EARNINGS, PER CAPITA, BY SELECTED INDUSTRIES, MALE WAGE EARNERS, CENSUS YEARS: 1899–1925

INDUSTRY AND TYPE OF EARNINGS	1899	1904	1909	1914	1919	1921	1923	1925
All industries:								
Full time	$587	$659	$729	$804	$1,601	$1,634	$1,726	------
Actual	498	540	631	644	1,354	1,170	1,562	------
Bread and other bakery products:								
Full time	579	667	740	773	1,399	1,665	1,652	1,721
Actual	430	548	616	591	1,157	1,264	1,282	1,298
Flour-mill and gristmill products:								
Full time	582	588	629	718	1,294	1,411	1,377	1,441
Actual	432	483	523	549	1,070	1,071	1,069	1,087
Confectionery:								
Full time	594	638	690	792	1,411	1,628	1,709	1,716
Actual	461	484	546	642	1,174	1,236	1,345	1,448
Slaughtering and meat packing:								
Full time	613	681	722	790	1,627	1,634	1,581	1,655
Actual	491	575	591	613	1,484	1,278	1,451	1,402
Liquors, malt:								
Full time	690	767	805	912	1,403	1,687	1,640	------
Actual	598	683	697	794	1,249	1,277	1,561	------
Mineral and soda waters:								
Full time	482	524	545	593	975	1,159	1,183	------
Actual	408	465	451	512	866	875	1,121	------
Tobacco, cigars and cigarettes:								
Full time	536	564	586	648	1,094	1,106	1,135	1,162
Actual	441	468	479	529	907	898	947	978
Carpets and rugs, other than rag:								
Full time	547	582	652	657	1,484	1,763	1,933	1,804
Actual	453	474	561	547	1,195	1,361	1,664	1,521
Shirts:								
Full time	574	598	664	711	1,261	1,417	1,423	1,387
Actual	476	487	571	592	1,015	1,094	1,225	1,092
Clothing, men's:								
Full time	670	744	833	893	2,017	2,180	2,157	2,083
Actual	555	606	716	743	1,624	1,683	1,857	1,639
Clothing, women's:								
Full time	652	741	852	911	1,970	2,140	2,224	2,319
Actual	541	604	733	758	1,586	1,652	1,915	1,825
Cotton manufactures:								
Full time	425	452	520	574	1,220	1,184	1,260	1,193
Actual	366	380	450	497	1,043	984	1,090	1,015
Dyeing and finishing textiles, exclusive of that done in textile mills:								
Full time	556	567	624	664	1,327	1,475	1,500	1,548
Actual	461	462	537	552	1,068	1,139	1,292	1,224
Knit goods:								
Full time	472	492	556	639	1,170	1,318	1,397	1,461
Actual	391	401	478	532	942	1,017	1,203	1,150
Silk goods, including throwsters:								
Full time	587	618	710	797	1,569	1,717	1,856	1,984
Actual	487	504	611	663	1,263	1,326	1,598	1,561
Woolen and worsted goods:								
Full time	470	512	563	629	1,330	1,422	1,530	1,623
Actual	306	392	479	477	964	1,054	1,281	1,115
Boots and shoes, not including rubber boots and shoes:								
Full time	620	697	752	829	1,505	1,686	1,683	1,652
Actual	549	597	680	695	1,342	1,354	1,511	1,371
Leather, tanned, curried, and finished:								
Full time	514	565	616	677	1,451	1,406	1,469	1,503
Actual	427	453	522	532	1,223	1,042	1,510	1,103
Furniture:								
Full time	581	646	724	801	1,454	1,648	1,729	1,777
Actual	469	518	594	616	1,192	1,239	1,617	1,734
Lumber and timber products:								
Full time	428	542	520	596	1,220	1,030	1,153	1,154
Actual	346	435	426	458	1,000	775	1,078	1,126
Lumber, planing-mill products, not including planing mills connected with sawmills:								
Full time	556	654	719	811	1,327	1,549	1,622	1,661
Actual	449	525	590	624	1,088	1,165	1,517	1,621
Paper and wood pulp:								
Full time	474	551	606	683	1,350	1,373	1,418	1,471
Actual	447	505	583	615	1,284	1,164	1,462	1,414

TABLE 38.—ESTIMATED AMOUNTS OF FULL-TIME AND ACTUAL ANNUAL MONEY EARNINGS, PER CAPITA, BY SELECTED INDUSTRIES, MALE WAGE EARNERS, CENSUS YEARS: 1899–1925—Continued

INDUSTRY AND TYPE OF EARNINGS	1899	1904	1909	1914	1919	1921	1923	1925
Printing and publishing, book and job:								
Full time	652	732	806	908	1,516	1,977	2,066	2,174
Actual	587	639	739	780	1,398	1,771	2,012	2,044
Printing and publishing, newspapers and periodicals:								
Full time	639	743	818	928	1,442	1,946	2,042	2,236
Actual	575	649	750	797	1,330	1,744	1,989	2,111
Chemicals:								
Full time	(1)	588	641	735	1,411	1,353	1,433	1,558
Actual	(1)	534	567	641	1,256	1,026	1,360	1,382
Petroleum refining:								
Full time	615	669	789	856	1,705	1,819	1,744	1,800
Actual	657	586	671	750	1,473	1,339	1,606	1,627
Brick and tile, pottery, terra-cotta, and fire-clay products:								
Full time	465	567	629	703	1,287	1,401	1,525	1,559
Actual	365	498	576	565	1,187	1,100	1,504	1,503
Glass:								
Full time	713	820	796	919	1,583	1,755	1,739	1,755
Actual	635	695	637	802	1,420	1,341	1,664	1,650
Iron and steel, blast furnaces:								
Full time	590	678	800	969	2,216	1,972	2,020	1,946
Actual	478	507	661	680	1,777	1,158	1,768	1,611
Iron and steel, steel works and rolling mills:								
Full time	703	748	860	958	2,155	1,751	2,096	2,102
Actual	570	560	710	673	1,728	1,028	1,834	1,740
Foundry and machine-shop products:								
Full time	736	809	874	954	1,828	1,820	2,022	2,103
Actual	590	603	711	674	1,450	1,103	1,733	1,722
Rubber tires, tubes, and rubber goods, not elsewhere classified:								
Full time	635	713	856	999	2,105	2,041	2,168	2,374
Actual	437	469	627	657	1,513	1,237	1,667	1,792
Smelting and refining:								
Full time	652	749	779	839	1,409	1,318	1,484	1,461
Actual	509	576	616	619	1,084	742	1,244	1,159
Automobile bodies and parts:								
Full time	(1)	600	702	810	1,495	1,554	1,709	1,812
Actual	(1)	421	539	605	1,099	836	1,369	1,491
Automobiles:								
Full time	689	710	759	987	1,739	1,818	1,989	2,031
Actual	509	498	583	737	1,278	978	1,593	1,672
Cars, steam-railroad, not including operations of railroad companies:								
Full time	590	694	728	888	1,741	1,748	1,872	1,790
Actual	365	389	430	535	1,182	869	1,387	1,257
Railroad repair shops—electric:								
Full time	790	806	814	895	1,580	1,822	1,790	1,886
Actual	600	590	650	655	1,226	1,035	1,516	1,516
Railroad repair shops—steam:								
Full time	701	761	815	876	1,797	2,056	1,882	1,849
Actual	532	557	651	641	1,394	1,168	1,594	1,487
Agricultural implements:								
Full time	601	660	706	891	1,531	1,637	1,637	1,630
Actual	413	434	517	586	1,101	992	1,259	1,231
Shipbuilding, steel:								
Full time	589	640	691	844	1,765	1,663	1,663	1,677
Actual	405	421	507	555	1,269	1,008	1,279	1,266
Electrical machinery, apparatus, and supplies:								
Full time	605	658	704	776	1,401	1,506	1,627	1,684
Actual	416	433	516	511	1,007	913	1,251	1,271

[1] No data.

In Table 39 are given the ratios of actual and full-time earnings for each of 12 selected industries for each year since 1914, the data for intercensal years being interpolated after the fashion explained in Chapter XIX. The absolute amounts of actual and full-time earnings, respectively—from which amounts the ratios in Table 39 were calculated—are shown in Figures 14A and 14B for each year from

FULL-TIME AND ACTUAL MONEY EARNINGS, PER CAPITA,

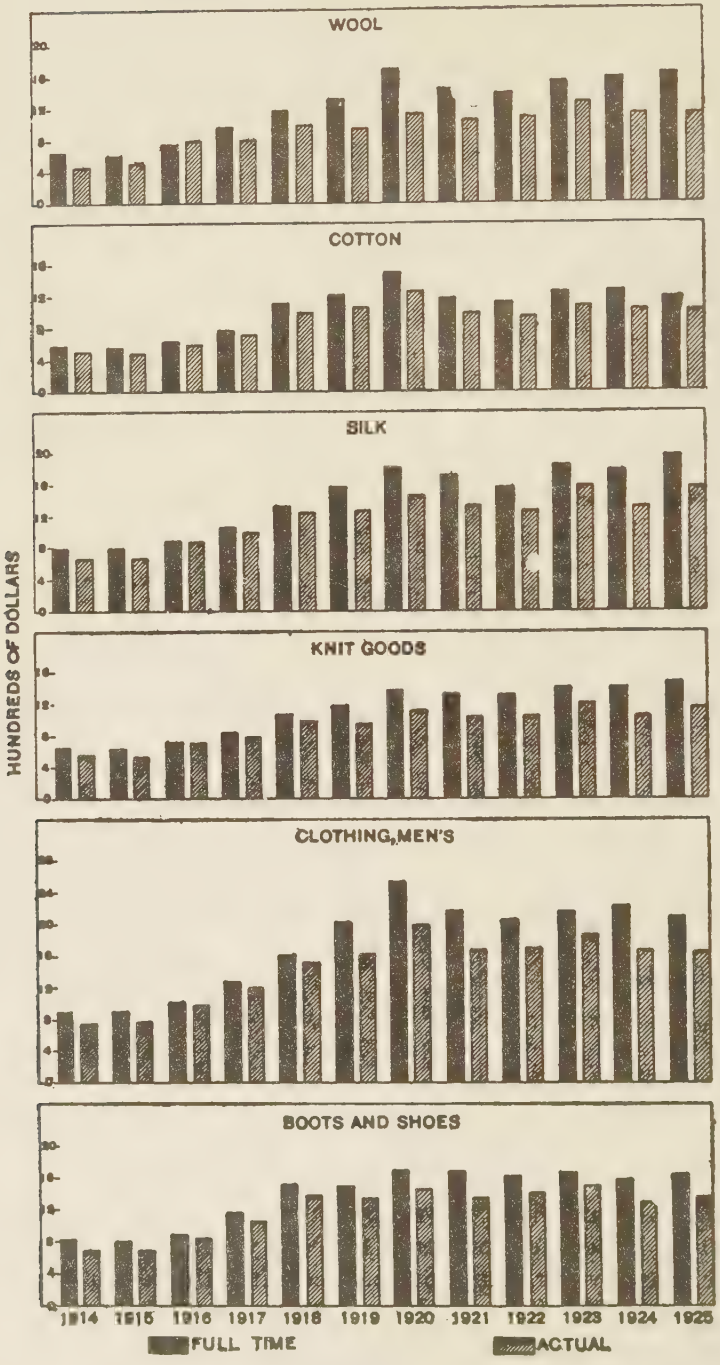


FIG. 14A

12 Selected Industries, Each Year: 1914–1925

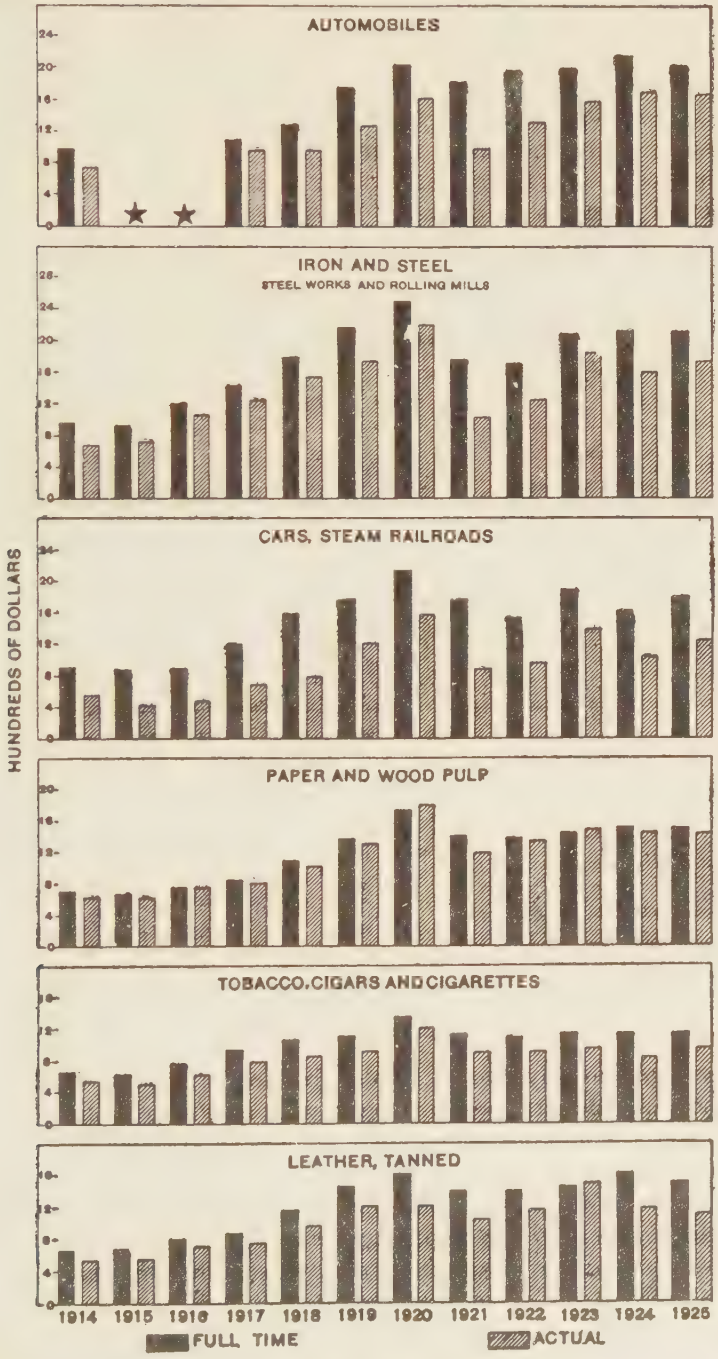


Fig. 14b

1914 to 1925, inclusive. Having the data for intercensal years as well as census years, it is possible to see more clearly the effect upon earnings of fluctuations in business conditions. Census years do not always fall at the apex of full activity in business, or at the bottom of the trough of depression in business. Annual figures bring us somewhat closer to a complete picture of the ups and downs of employment and the consequent ups and downs of earnings.

It is noticeable that there are one or two cases where the figures show actual earnings in excess of full-time earnings. An instance of this is the paper and wood pulp industry in 1920. This is

TABLE 39.—ESTIMATED PERCENTAGES OF ACTUAL TO FULL-TIME MONEY EARNINGS, PER CAPITA, FOR SELECTED INDUSTRIES, MALE WAGE EARNERS, 1899, 1904, 1909, AND FOR EACH YEAR 1914–1925

INDUSTRY	1899	1904	1909	1914	1915	1916	1917	1918
Woolen and worsted goods	65.1	76.6	85.1	75.8	80.0	103.0	85.0	84.5
Cotton manufactures	86.1	84.1	86.5	86.6	86.5	90.6	91.5	90.5
Silk goods, not including throwsters	83.0	81.6	86.1	83.2	84.9	98.5	94.5	93.5
Knit goods	82.8	81.5	86.0	83.2	85.0	98.5	94.5	93.5
Clothing, men's	82.8	81.5	86.0	83.2	85.0	98.5	94.5	93.5
Boots and shoes, not including rubber boots and shoes	88.5	85.7	90.4	83.8	86.5	94.5	91.5	89.5
Automobiles	73.9	70.1	76.8	74.7	----	----	90.0	75.5
Iron and steel, steel works and rolling mills	81.1	74.9	82.6	70.3	78.0	89.4	87.0	86.0
Cars, steam-railroad, not including operations of railroad companies	61.9	56.1	59.1	60.2	48.5	55.5	57.5	51.0
Paper and wood pulp	94.3	91.7	96.2	90.0	93.0	100.0	97.0	95.0
Tobacco, cigars and cigarettes	82.3	83.0	81.7	81.6	77.5	81.0	84.5	81.5
Leather, tanned, curried, and finished	83.1	80.2	84.7	78.6	81.5	89.0	86.0	84.5

INDUSTRY	1919	1920	1921	1923	1923	1924	1925
Woolen and worsted goods	71.7	66.5	74.1	78.0	83.7	71.0	68.7
Cotton manufactures	85.5	85.0	83.1	85.0	86.5	82.0	85.1
Silk goods, not including throwsters	80.5	80.0	77.2	80.0	85.9	74.9	78.7
Knit goods	80.5	80.0	77.2	80.0	85.9	75.0	78.7
Clothing, men's	80.5	78.0	77.2	82.0	86.0	75.1	78.7
Boots and shoes, not including rubber boots and shoes	89.2	85.5	89.3	87.5	90.0	82.3	83.0
Automobiles	73.5	80.0	58.8	67.5	80.1	67.9	82.3
Iron and steel, steel works and rolling mills	80.2	87.5	58.7	73.5	87.3	75.0	82.8
Cars, steam-railroad, not including operations of railroad companies	67.9	74.0	49.7	62.5	74.2	63.0	70.2
Paper and wood pulp	95.1	108.0	84.8	97.0	103.0	90.8	96.1
Tobacco, cigars and cigarettes	82.9	89.5	81.2	83.0	83.1	73.7	84.2
Leather, tanned, curried, and finished	84.3	76.0	74.1	83.5	102.8	73.2	73.4

probably explained by the fact that the year 1920 for the paper and wood pulp industry was the peak year of employment, and in this industry the amount of employment was so great as to amount to more than the equivalent of the employment of all attached to that industry for full time. This does not mean that there was not any unemployment in the paper and wood pulp industry in 1920. There was undoubtedly some unemployment but the amount of overtime worked was evidently so great that it more than compensated for the unemployment due to short-time operation or unemployment in any other form. In the same industry in 1916 it seems that

the figures for actual earnings are exactly the same as those for full-time earnings, namely, $733. The year 1916 was, of course, also one of prosperity. Possibly there was exceptional prosperity in the paper and wood pulp industry, and although there was unemployment in the industry, it was evidently compensated for by the amount of overtime put in, so that actual amount of employment distributed among all those engaged in the industry was equivalent to the amount of employment necessary to give each one of those attached to the industry regular work throughout that year. If the 1923 figures can be trusted, we have a third instance in the paper and wood pulp industry where actual earnings did not fall short of full-time earnings. In 1923 actual earnings were $1,462 and full-time earnings were $1,418, indicating more than the equivalent of full-time employment for all attached to the industry. Another case of the same sort occurs in the leather industry, and this also is for the year 1923, the figures indicating that average actual earnings were $1,510, whereas full-time earnings were only $1,469. The reason for this situation is undoubtedly the same as in the case of the paper and wood pulp industry.[5]

[5] The National Bureau of Economic Research reports (in Employment, Hours, and Earnings in Prosperity and Depression, pp. 49–52) the following percentages of full time worked in the paper and printing group in 1920; first quarter, 98.7; second quarter, 98.6; third quarter, 98; fourth quarter, 98.5. In June, 1923, in New York, the leading State in the paper and pulp industry, 36 per cent of the workers in that industry worked overtime, while 44 per cent worked full time, 12 per cent 5 days a week, 4 per cent 4 days a week, and 4 per cent 3 days or less. 2, Industrial Bull., 214 (1923). In the United States as a whole there were in 1923 only a very small proportion of the workers in the paper and pulp industry unemployed; the census returns for that year show that the minimum monthly number employed was 95.8 per cent of the maximum number.

In the report of its Industrial Survey in 1918 and 1919, the United States Bureau of Labor Statistics reported that for 1919 the per cent of full time worked was 92 for male employees in the leather industry and 101.2 for male employees in the paper and pulp industry. 10, Monthly Labor Review, 1177–79 (May, 1920).

Chapter IV

ESTIMATED AMOUNTS OF MONEY EARNINGS

In the preceding chapter we were concerned with full-time earnings, so called, and with the relation between such earnings and the actual earnings received under conditions of employment, health, etc., prevailing from year to year. Obviously "full-time earnings" are not comparable with earnings actually received. The former are annual rates and are, in some respects, comparable with other time rates such as hourly and weekly rates of wages. In this and the following chapter we leave behind us this somewhat spurious form of earnings and concern ourselves entirely with earnings in the proper sense of the term. This present chapter deals with amounts of money earnings; it is followed by a chapter devoted to the "real" amounts obtained by deflating the money sums with the cost of living index. The subject of full-time earnings, so called, is introduced again in Chapter VI in order to compare the purchasing power of those earnings with the purchasing power of earnings actually received.

In Chapters XV and XVI there is given a detailed description of the method by which amounts of actual earnings are estimated from corresponding amounts of full-time earnings. It is not necessary, therefore, to introduce at this point any discussion of the technique followed in arriving at the figures presented in the following tables. However, before proceeding to discuss the estimated amounts of earnings, it may be helpful to give some indication of the possible margin of error to which these final estimates of amounts of earnings probably are subject. This will be done by indicating the range above and below the final estimate and comprehended between the minimum estimate of earnings calculated by Method A and the maximum estimate of the amount of earnings calculated by Method B, both of which methods are fully described in Chapter XVI. As already stated, the final estimates have been made by striking an average between the estimates arrived at by the two methods. The difference, therefore, between the final estimate and either the maximum or minimum is one-half of the total range between them. In the case of all industries combined, for the United States as a whole, the mean earnings calculated by Method A are 9 per cent lower than the final estimates; the maximum earnings calculated by Method B, for all industries combined, are 9 per cent

higher than the final estimates. The three estimates, high, low, and final, have been set side by side in Table 34. Taking the amounts for 1923 for illustration, our final estimate is $1,398, the minimum estimate $1,272, and the maximum $1,530. For reasons explained elsewhere and which inhere in the two methods of computation referred to, it is believed that the first figure is an amount below which it is not likely that average earnings could have fallen, and that the latter amount is a sum above which it is very unlikely that the average earnings could possibly have risen. In other words, the minimum estimate was made on the basis of an assumption which at each step resolved all doubts in favor of procedure which would involve low earnings, while the maximum estimate was calculated similarly on the principle of resolving all doubts in favor of the choice which meant higher earnings. It was not, of course, expected that the mistakes on either side would cancel each other in the end, but it is believed that the final estimates arrived at by averaging the minimum and maximum estimates, probably indicate the true amounts of average earnings, for all industries combined, within a margin of error of 9 per cent. That margin, as elsewhere recognized, is wider for certain of the selected industries and for some of them it is narrower, the range in this percentage of probable error among the selected industries being from 1 per cent to 17 per cent.

SUMMARIES FOR CENSUS YEARS

A summary for each manufactures census year for the country as a whole, of the amounts of earnings per capita in each sex and age group and in all groups combined is given in Table 40. This table reflects the extremely wide margins between earnings in the different sex and age groups. It is perhaps not realized, however, that the differences in amounts of earnings between men and women and between women and children are as great as seems to be indicated by these figures. By and large, the average wages of male workers in manufacturing industries seem to be somewhat greater than the

TABLE 40.—ESTIMATED ANNUAL AMOUNTS OF MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, ALL INDUSTRIES COMBINED, BY SEX AND AGE GROUPS, CENSUS YEARS: 1899–1923

CENSUS YEAR	All groups	Men 16 years of age and over	Women 16 years of age and over	Children under 16 years of age
1899	$446	$498	$267	$152
1904	483	540	289	164
1909	557	631	339	192
1914	576	644	344	195
1919	1,212	1,354	726	412
1921	1,047	1,170	627	356
1923	1,398	1,562	837	475

sums of the averages of the earnings of women and children. In the case of no one census year shown in Table 40 does the sum of the averages for women and children equal the average wage for men.[1]

REGIONAL DIFFERENCES IN MONEY EARNINGS

In Table 41 are given the estimated amounts of per capita money earnings of manufacturing wage earners in the United States, classified by geographic regions, for each manufactures census year from 1899 to 1923, inclusive. The figures are for all sex and age groups combined. It is to be carefully borne in mind in examining the figures in Table 41 and in the tables following it, that the figures given are estimates and are not presumed to be accurate to the last dollar. It should further be borne in mind that each figure is an average and that as an average it necessarily covers what undoubtedly

TABLE 41.—ESTIMATED AMOUNTS OF MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, BY GEOGRAPHIC REGIONS AND DIVISIONS, ALL SEX AND AGE GROUPS COMBINED, CENSUS YEARS: 1899–1923

REGION	1899	1904	1909	1914	1919	1921	1923
UNITED STATES	$446	$483	$557	$576	$1,212	$1,047	$1,317
NORTHEAST	457	497	572	597	1,385	1,053	1,431
New England	422	454	518	524	1,188	893	1,181
Middle Atlantic	456	491	565	571	1,387	1,044	1,501
East North Central	464	529	602	656	1,509	1,150	1,521
West North Central	455	519	591	624	1,290	1,076	1,278
SOUTH	307	357	403	430	959	768	975
South Atlantic	295	334	385	415	976	759	962
East South Central	324	376	405	430	928	752	980
West South Central	360	434	463	497	981	842	1,016
WEST	579	690	795	776	1,412	1,269	1,554
Mountain	652	749	799	805	1,354	1,269	1,556
Pacific	556	671	813	768	1,427	1,243	1,609

are very wide variations in earnings between different individuals whose earnings enter into the average. On the other hand, these averages are not derived from samples; they represent all of the wage earners in manufacturing industries in the United States (with the unimportant exception, involving an inappreciable proportion of the wage earners, of establishments having products valued at less than $5,000). The figures given in Table 41 show that there is a wide difference in amounts of earnings between different geographic divisions, the most outstanding fact being that earnings in the South are lower by a very considerable margin than are earnings for corresponding years in the other two regions of the country. In the Northeast the series of amounts begin in 1899 with $457 and run irregularly to a peak of $1,385 in 1919, drops to $1,053 in 1921 and rise to a new high level of $1,431 in 1923. In the West, they run from $579 in

[1] Further comparison between the earnings of men and women in individual industries is made in Table 44, p. 110.

1899 irregularly up to $1,412 in 1919, drop to $1,249 in 1921 and rise to a new high level of $1,594 in 1923. In direct contrast to this we find in the South that per capita earnings in 1899 were only $307, and that from that census year they show an irregular increase to a peak of $959 in 1919, a decline to $768 in 1921 and a final rise to a new high level of $975 in 1923.

The margin between the West and the Northeast is narrower than between either of those two regions and the South. The West shows the highest earnings in the country. It should be noted that the figures for the United States as a whole show a very marked recovery in 1923 from the low amounts of earnings in 1921, and that all of the geographic divisions shared in a greater or less degree in this recovery. These recent fluctuations, as well as earlier ones of lesser magnitude, are, of course, discussed in Part III in connection with changes in earnings.

Further scrutiny of the figures in Table 41 for the nine geographic divisions indicates that there is, on the whole, less difference in the amounts of per capita earnings between geographic divisions within the three grand divisions than between each of those three divisions. The two geographic divisions in the western region, the three divisions in the southern region and, with one possible exception, the four divisions in the northeastern region run, respectively, fairly close together. The most noticeable exception appears to be New England in the northeastern region where average per capita money earnings in each census year were considerably lower than in the other three geographic divisions in the northeast region. There is a similar difference, though less marked, between the West South Central division and the other two southern divisions, distinctly in favor of the West South Central division. It is the South in the strict sense of the southeast region of the United States that makes up the great low-earnings area of the country. When we get into the southwest, earnings exhibit an appreciable tendency toward the higher wages of the West and North.

Probably the regional classification shown in Table 41 is more significant and revealing than are separate figures for each of the 48 States. It may, nevertheless, be useful to supplement the regional figures with results for the separate States and these latter results, therefore, are presented in Table 42 (p. 107). It is evident at once that there are few States in which the average for the geographic division closely reflects the earnings in the State. Wyoming is a striking example. In that State the estimated money earnings were $2,014 for 1919 and $1,933 for 1921. The corresponding figures for the geographic division of which Wyoming is a part—the Mountain division—are $1,354 and $1,269, respectively. Arizona, at least in 1919, furnishes another instance of this intraregional variation.

It is noteworthy that the range of variation as between the States appears to have been unusually wide in the census years 1919 and 1921. Moreover, it would appear that one may rely more confidently upon the geographic division averages for the years prior to 1919 than for that and following census years.[2]

The results shown for the separate States, when compared with similar results for the 41 selected industries shown later, will demonstrate quite conclusively that geographic differences in wages are not only not insignificant, but are quite comparable with industrial differences. Indeed, on the face of the returns here presented, it will probably appear to the casual reader that there is a wider range between States than between industries. This probably is an illusion, but when all is said, it remains very evident that there is a tremendous variation in the amounts of earnings between different sections of the country.

The figures of Table 42 for the year 1923 have been made the basis of the frontispiece map on page 2.[3] It shows only two States—Georgia and South Carolina—in the lowest earnings group (under $700). In the next to the lowest group ($700–$800) are two more Southern States—North Carolina and Mississippi. In the next higher group ($800–$900) is Arkansas. In the $900 group are all the remaining Southern States except Texas. In the $1,000–$1,100 group are New Hampshire, Virginia, and Texas. The $1,100 group includes Maine, Vermont, Massachusetts, Rhode Island, Maryland, and Kentucky. The $1,200 group includes Iowa, Missouri, South Dakota, Kansas, Delaware, and Utah. In the $1,300 bracket are Connecticut, New York, Pennsylvania, Wisconsin, Minnesota, Nebraska, Oklahoma, and New Mexico; in the $1,400 group, New Jersey, Indiana, North Dakota, District of Columbia, West Virginia, Colorado, and Oregon; and in the highest earnings group (over $1,500) all of the remaining Rocky Mountain and Pacific States and the three Middle Western States of Michigan, Illinois, and Ohio.

INDUSTRIAL DIFFERENCES IN MONEY EARNINGS

By a method of interpolation, elsewhere described, it has been possible to interlard the census year estimates of per capita earnings with corresponding estimates of amounts of earnings for intercensal

[2] See Table 54, p. 123, where nominal hourly earnings are shown by geographic divisions.

[3] The same map appears below (fig. 20, p. 141) as a part of the insert series of three maps reflecting per capita real earnings in 1899, 1914, and 1923.

years.[4] The results for each of 12 selected industries are shown in Table 43. The introduction of the figures for the intercensal years shows that the peak year of money earnings, in the case of all

TABLE 42.—ESTIMATED AMOUNTS OF AVERAGE MONEY EARNINGS, ALL INDUSTRIES COMBINED, BY STATES, CENSUS YEARS: 1899–1923

STATE	1899	1904	1909	1914	1919	1921	1923
United States	$446	$483	$557	$576	$1,212	$1,047	$1,317
Maine	375	442	503	526	1,241	947	1,157
New Hampshire	386	425	484	506	1,101	853	1,091
Vermont	396	435	509	530	1,111	873	1,107
Massachusetts	432	455	519	530	1,186	899	1,189
Rhode Island	402	432	502	502	1,105	875	1,145
Connecticut	467	486	554	546	1,283	893	1,388
New York	455	489	573	573	1,330	1,073	1,383
New Jersey	460	489	558	564	1,387	1,041	1,425
Pennsylvania	464	494	563	574	1,462	1,013	1,392
Ohio	468	527	611	643	1,565	1,129	1,527
Indiana	460	501	576	636	1,412	1,107	1,426
Illinois	502	572	646	687	1,470	1,207	1,528
Michigan	427	492	576	703	1,653	1,237	1,675
Wisconsin	436	502	577	603	1,346	1,006	1,318
Minnesota	479	546	628	655	1,338	1,122	1,321
Iowa	422	480	577	642	1,331	1,100	1,290
Missouri	452	515	576	593	1,197	1,020	1,236
North Dakota	496	585	672	726	1,381	1,268	1,491
South Dakota	521	579	684	696	1,447	1,177	1,272
Nebraska	474	539	598	659	1,442	1,138	1,307
Kansas	471	525	609	609	1,359	1,101	1,297
Delaware	407	433	503	495	1,446	917	1,201
Maryland	365	402	466	499	1,268	915	1,148
District of Columbia	449	510	598	588	1,093	1,149	1,457
Virginia	320	352	386	430	1,048	847	1,047
West Virginia	393	480	544	601	1,260	1,129	1,410
North Carolina	183	227	270	297	753	550	736
South Carolina	184	214	271	303	747	540	678
Georgia	234	279	333	337	800	586	699
Florida	351	413	467	480	1,031	772	980
Kentucky	362	401	441	474	977	911	1,164
Tennessee	316	359	387	414	842	725	911
Alabama	303	366	414	437	994	732	998
Mississippi	297	372	381	390	892	605	789
Arkansas	287	380	390	416	844	628	811
Louisiana	359	438	449	480	959	762	938
Oklahoma	373	493	557	592	1,175	1,115	1,376
Texas	415	455	519	533	1,019	934	1,095
Montana	744	919	942	880	1,415	1,229	1,614
Idaho	605	748	783	914	1,530	1,366	1,719
Wyoming	701	795	892	871	2,014	1,933	2,128
Colorado	644	715	770	748	1,299	1,261	1,484
New Mexico	498	616	657	691	1,195	946	1,305
Arizona	745	816	888	870	2,099	1,226	1,524
Utah	500	603	707	720	1,102	1,138	1,292
Nevada	753	897	968	991	1,483	1,521	1,914
Washington	587	700	797	787	1,589	1,174	1,623
Oregon	501	636	752	727	1,471	1,106	1,482
California	555	669	798	772	1,341	1,304	1,641

of the 12 industries, except automobile manufacturing and knit goods, was either 1920 or 1923. In these two industries 1925 appears to have been the peak year.

[4] The estimate for 1927 is not based directly upon the census returns which at this writing were not yet tabulated for that year. The method of interpolation is explained in Ch. XIX.

TABLE 43.—ESTIMATED AMOUNTS OF MONEY EARNINGS, PER CAPITA, FOR EACH OF 12 INDUSTRIES, EACH YEAR, 1899–1927, MALE WAGE EARNERS

[Manufactures census years in bold-faced type]

YEAR	Woolen and worsted goods	Cotton manufactures	Silk goods	Knit goods	Clothing, men's	Boots and shoes
1899	$306	$366	$487	$391	$555	$549
1900	315	392	453	392	565	541
1901	395	394	450	390	572	567
1902	401	414	516	396	596	598
1903	386	425	531	400	591	598
1904	392	380	504	401	606	597
1905	451	378	542	593	628	630
1906	525	424	555	433	657	663
1907	549	483	605	438	670	699
1908	463	475	575	[1] 368	650	694
1909	479	450	611	478	716	680
1910	481	450	610	493	802	687
1911	479	446	620	502	861	688
1912	498	486	629	521	838	691
1913	469	517	672	526	859	696
1914	477	497	663	532	743	695
1915	487	481	677	539	759	687
1916	780	585	883	702	982	842
1917	800	711	992	776	1,195	1,059
1918	985	1,006	1,230	979	1,503	1,372
1919	954	1,043	1,263	942	1,624	1,342
1920	1,123	1,267	1,458	1,109	1,979	1,459
1921	1,054	984	1,326	1,017	1,683	1,354
1922	1,073	956	1,250	1,034	1,697	1,420
1923	1,281	1,090	1,598	1,203	1,857	1,511
1924	1,118	1,037	1,328	1,051	1,688	1,312
1925	1,115	1,015	1,561	1,150	1,639	1,371
1926	1,117	1,015	1,567	1,197	1,598	1,361
1927	1,128	1,048	1,580	1,237	1,590	1,360

YEAR	Automobiles[2]	Iron and steel, steel works and rolling mills	Cars, steam-railroad	Paper and wood pulp	Tobacco, cigars and cigarettes	Leather, tanned
1899	$509	$570	$365	$447	$441	$427
1900	514	604	402	465	454	444
1901	537	467	420	469	450	440
1902	567	513	464	492	476	438
1903	569	507	449	487	471	453
1904	498	560	389	505	468	453
1905	553	661	467	515	465	453
1906	585	663	436	550	467	557
1907	650	717	447	566	482	548
1908	629	549	397	512	487	525
1909	583	710	430	583	479	522
1910	665	731	387	589	489	525
1911	618	753	490	595	498	532
1912	600	781	559	606	508	527
1913	659	774	563	612	524	538
1914	737	673	535	615	529	532
1915	[3] 649	712	417	600	481	538
1916	[3] 680	1,064	473	733	612	704
1917	965	1,236	678	797	777	734
1918	954	1,531	789	1,000	850	978
1919	1,278	1,728	1,182	1,284	907	1,223
1920	1,618	2,187	1,560	1,760	1,206	1,214
1921	978	1,028	869	1,164	898	1,042
1922	1,328	1,248	949	1,315	899	1,174
1923	1,593	1,834	1,387	1,462	947	1,510
1924	1,715	1,604	1,030	1,429	836	1,197
1925	1,672	1,740	1,257	1,414	978	1,103
1926	1,617	1,768	1,273	1,442	1,000	1,116
1927 [4]	1,601	1,738	1,301	1,428	989	1,103

[1] The estimate for 1908 is arrived at by applying to the estimate for 1907 the percentage of decline for "All industries," 1907 to 1908.

[2] Intercensal year data to 1907 based on "All industries combined."

[3] Based on Massachusetts data only.

[4] The figures for 1927, in this and other tables that present data for these 12 selected industries, have been interpolated from the estimates for 1925; with the aid of the indexes of employment and of pay rolls published by the United States Bureau of Labor Statistics.

The earnings figures which are shown separately for the 12 industries are reported in annual form throughout the period from 1899 to 1925. There are evident marked variations between the different industries in respect to amounts of earnings. The differences between industries, moreover, are themselves subject to wide fluctuations. The degree to which unemployment affected the different industries, therefore subtracting from earnings, is apparent on the face of the figures. The industry in which earnings were most seriously reduced in the precipitate drop from the peak of prosperity in 1920 to the depression of 1921 was the iron and steel industry. In that industry earnings appear in 1921 to have been less than one-half their amount in 1920. The automobile, car-building, and paper and wood pulp industries were also hard hit. Differences of like nature appear also in the process of recovery from the depression in 1921 on through 1922 and 1923. Annual fluctuations in money earnings were much less wide in the pre-war years; fairly large differences are noticeable, however, at the depressions of 1904 and 1908. It should be noted that the pre-war intercensal estimates of the amounts of earnings are subject to an even wider margin of error than the corresponding estimates of the war and postwar periods.[5]

It is worth noting, perhaps, that at least two of the industries whose wage earners suffered most in reduction of earnings in the depression of 1921 (automobiles and iron and steel) show average earnings received by their employees considerably higher than the average for all industries. The wage earners in the men's clothing industry, however, not only escaped without such a serious reduction in earnings as befell iron and steel workers, but it appears from these estimates that throughout the 10-year period their average annual earnings have been considerably higher than the average—higher, indeed, in most of the census years than have been earnings of workers in either the automobile or iron and steel industry. It is to be remembered in making these comparisons between separate industries and the general figures for all industries combined, that the data for all industries represent in every case not an average of whatever selected industries are shown, whether 12 or 41 in number, but all of the manufacturing industries covered by the census; that is to say, the figures for all industries combined include in most of the tables many more industries than are shown separately in any of them. Exceptions are the tables of index numbers which report changes in earnings in the 6 industrial divisions and 14 groups of industries and, of course, those tables which report earnings by States or geographic regions.

A more comprehensive industrial classification of American manufacturing industries is shown in Table 44, wherein are given the estimated amounts of money earnings per capita for men and women,

[5] For an explanation of the method by which the pre-war intercensal estimates have been calculated, see Ch. XIX.

all industries combined, and in 18 of the 41 selected industries. Figures in this table, however, do not constitute a continuous annual series, but are available only for the manufactures census years from and including 1899. The 18 industries shown in the table are the

TABLE 44.—ESTIMATED AMOUNTS OF ACTUAL MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, BY SELECTED INDUSTRIES AND BY SEX, CENSUS YEARS: 1899–1925 [1]

INDUSTRY AND SEX	1899	1904	1909	1914	1919	1921	1923	1925
All industries:								
Men	$498	$540	$631	$644	$1,354	$1,170	$1,562	-------
Women	267	289	339	344	726	627	837	-------
Bread and other bakery products:								
Men	430	548	616	591	1,157	1,264	1,282	$1,298
Women	202	258	290	278	546	596	604	611
Confectionery:								
Men	461	484	546	642	1,174	1,236	1,345	1,448
Women	213	225	253	297	544	572	616	672
Mineral and soda waters:								
Men	408	465	451	512	866	875	1,121	-------
Women	207	236	229	260	440	445	569	-------
Tobacco, cigars and cigarettes:								
Men	441	468	479	529	907	898	947	978
Women	244	259	266	294	540	499	525	543
Carpets and rugs, other than rag:								
Men	453	474	561	547	1,195	1,361	1,664	1,521
Women	290	304	359	350	766	872	1,067	974
Shirts:								
Men	476	487	571	592	1,015	1,094	1,225	1,092
Women	259	265	310	322	554	595	667	593
Clothing, men's:								
Men	555	606	716	743	1,624	1,683	1,857	1,639
Women	259	283	335	346	757	784	865	765
Clothing, women's:								
Men	541	604	733	758	1,586	1,652	1,915	1,825
Women	285	319	387	400	838	872	1,010	963
Cotton manufactures:								
Men	366	380	450	497	1,043	984	1,090	1,015
Women	286	297	351	388	816	770	854	793
Dyeing and finishing textiles, exclusive of that done in textile mills.								
Men	461	462	537	552	1,068	1,139	1,292	1,224
Women	279	279	323	333	646	687	779	740
Knit goods:								
Men	391	401	478	532	942	1,017	1,203	1,150
Women	263	269	321	357	632	682	808	771
Silk goods, including throwsters:								
Men	487	504	611	663	1,263	1,326	1,598	1,561
Women	287	297	360	391	745	783	942	922
Woolen and worsted goods:								
Men	306	392	479	477	954	1,054	1,281	1,115
Women	220	281	343	343	685	759	918	799
Boots and shoes, not including rubber boots and shoes:								
Men	549	597	680	695	1,342	1,354	1,511	1,371
Women	352	382	435	444	859	866	966	877
Printing and publishing, book and job:								
Men	587	639	739	780	1,398	1,771	2,012	2,044
Women	296	323	373	394	706	894	1,000	1,033
Printing and publishing, newspapers and periodicals:								
Men	575	649	750	797	1,330	1,744	1,989	2,111
Women	259	292	338	359	599	787	894	952
Glass:								
Men	635	695	637	802	1,420	1,341	1,664	1,650
Women	208	227	208	262	464	438	544	540
Electrical machinery, apparatus, and supplies:								
Men	416	433	516	511	1,007	913	1,251	1,271
Women	225	234	279	276	545	494	674	688

[1] The estimated amounts of actual money earnings of men in the other 23 industries are shown in Table 38, p.96.

ones wherein there are an appreciable number of women wage earners, and for which, on that account, estimates have been made of average earnings of women as well as of men. In the 23 industries omitted from the table, practically all of the wage earners are men.

A comparison of the earnings of women with the earnings of men reflects the same disparity in the amounts of their earnings as was shown in Table 40 above, but the extent of this disparity is, of course, vastly different in different industries. Thus, for example, in 1919 the per capita earnings of men in the glass industry were more than three times the per capita earnings of the women employed in that industry; whereas in electrical machinery, apparatus, and supplies, the per capita earnings of men in that same year were not quite twice the per capita earnings of women. In cotton manufactures—a low-wage industry for men—the earnings of women more nearly approximated the earnings of men than in most other industries; in 1919 the average for women was $816, whereas that for men was $1,043. The wide differences which exist in the glass and electrical machinery industries are, no doubt, largely due to the fact that the women in those trades are unskilled or semiskilled, while the men are very highly skilled. In reality then the differences are often attributable less to the sex factor than to degree of skill.

Taking leave of any comparisons between the sexes, and looking into the relations shown in Table 44 between the different industries on the basis of the figures for the earnings of the men in those industries, we find here again as in Table 43 an extremely wide variation in earnings among the industries. That there are also wide differences in the course of earnings over the 27-year period covered is also evident even from these absolute figures. These changes in the trend of earnings in the different industries, however, will be discussed in a later chapter in connection with the relative fluctuations in labor incomes.

Twenty-four of the 41 selected industries have been selected for the purpose of a comparison designed to show the degree of uniformity, or otherwise, of earnings in the same industry in different parts of the country. For this purpose each of the 24 industries is reported in Table 45 for two of the States in which it is most strongly developed. Generally, choice has been made, in respect to each industry, of those two States in which that industry had the largest number of employees in 1919. In a few cases, however, in order to present comparisons between States somewhat widely separated geographically, the first and third, or second and fourth States were taken instead of the two leading States. If the present estimates are tolerably near the truth, it would appear from the figures in Table 45 that geographic differences in earnings are not alone due to the industrial specialization of certain States. It does not always follow, apparently, that because high wages are paid in some particular industry in one section of the country, that those same high wages will be paid to those engaged in that industry in another section of the country. The tendency, of course, with our modern marketing system distributing goods over national and even international areas,

is to widen the area of competition and therefore to unify labor as well as other cost items for employers. But there are evidently persistent factors which counteract the tendency to uniformity, such as differences in the cost of living, differences in the quality of labor, and real and persistent limitations upon the area of competition. At any rate, whatever the causes, it appears that the earnings of workers in the tobacco industry in Pennsylvania are much lower than the earnings of the workers in that industry in Florida, despite the fact that for industry as a whole the earnings of wage earners are lower in Florida than in Pennsylvania. The difference in favor of Florida seems to persist all the way through the period from 1899 to 1921. In the case of men's clothing, however, the differences between New York and Illinois are in some census years favorable to New York and in other years favorable to Illinois. In the case of woolen and worsted goods, and also in the case of the agricultural implement industry, there is practically no difference between the amounts of wages in the different regions. This may not, possibly, be significant in the case of agricultural implements since the two States concerned are not widely separated. There appears to be, in fact, a tendency, which is natural enough, for earnings to vary more widely, within the same industry, between the more widely separated States. When New York is compared with Maine in the paper and wood pulp industry, the amounts of earnings show up appreciably higher for Maine than for New York. Still more noticeable, when Louisiana is compared with Washington in the lumber and timber products industry, the State of Washington, as we should expect, shows very much higher average earnings than the State of Louisiana. In such a case as this last, the difference is probably attributable primarily to the fact that Washington is in the West and Louisiana is in the South; that is to say, the low-wage tendency in the South and the high-wage tendency in the Northwest easily overcome any force which might work toward uniformity in the earnings of lumber and timber workers wherever employed.

Table 45 presents comparative earnings in identical industries for the different States for men only; similar data for 14 of the industries shown in Table 45 are given in Table 46 for women alone. Almost the first thing one notices in the latter table is that although earnings in the tobacco industry are on a different level in Pennsylvania from earnings in Florida, the difference is not uniformily in favor of Florida as it appeared to be in the case of men wage earners. It was favorable to Florida during the period from 1899 to 1914, but for the census years 1919 and 1921 it appears that women workers in the tobacco industry have fared better in Pennsylvania than they fared in Florida. Other differences of the same sort appear in the table, but on the whole, the results for women correspond fairly closely with the results shown in the table for men.

TABLE 45.—ESTIMATED AMOUNTS OF MONEY EARNINGS, PER CAPITA, IN 24 SELECTED INDUSTRIES, BY SELECTED STATES, *MEN*: 1899–1921

INDUSTRY AND STATE	1899	1904	1909	1914	1919	1921
Tobacco, cigars and cigarettes:						
Florida	$466	$561	$563	$587	$970	$905
Pennsylvania	357	375	383	389	839	768
Clothing, men's:						
New York	597	599	689	685	1,675	1,696
Illinois	535	649	657	788	1,777	1,948
Clothing, women's:						
New York	591	618	756	775	1,708	1,783
Illinois	592	809	930	983	1,902	1,938
Cotton manufactures:						
Massachusetts	402	405	500	512	1,097	1,035
North Carolina	212	253	334	370	886	728
Knit goods:						
Pennsylvania	412	427	490	574	1,036	1,186
New York	412	413	519	540	967	1,075
Shirts:						
New York	501	488	592	583	1,108	1,219
Pennsylvania	571	624	710	719	1,096	1,198
Silk goods, including throwsters:						
Pennsylvania	374	433	552	623	1,189	1,307
New Jersey	524	526	660	725	1,363	1,385
Woolen goods:						
Massachusetts	378	417	475	510	1,075	1,089
Pennsylvania	425	418	507	546	1,244	1,148
Worsted goods:						
Massachusetts	432	447	542	580	1,144	1,173
Pennsylvania	433	463	532	586	1,307	1,253
Boots and shoes, not including rubber boots and shoes:						
Massachusetts	560	619	692	726	1,289	1,311
Missouri	492	582	694	666	1,093	1,268
Leather, tanned, curried, and finished:						
Massachusetts	456	467	522	552	1,161	1,109
Pennsylvania	414	448	515	557	1,247	1,127
Furniture:						
New York	455	491	548	556	1,095	1,174
Michigan	395	456	522	568	1,105	1,201
Lumber and timber products:						
Washington	559	676	746	753	1,570	1,155
Louisiana	322	451	433	505	1,013	717
Lumber, planing-mill products, not including planing mills connected with sawmills:						
New York	463	529	588	603	1,129	1,282
California	598	741	864	839	1,288	1,363
Paper and wood pulp:						
New York	397	449	509	538	1,149	1,141
Maine	425	497	594	615	1,230	1,267
Printing and publishing, newspapers and periodicals:						
New York	701	773	875	919	1,419	1,813
Illinois	486	637	675	701	1,129	1,588
Printing and publishing, book and job:						
New York	617	637	729	758	1,451	1,739
Illinois	584	684	781	860	1,564	1,792
Glass:						
Pennsylvania	638	756	715	759	1,525	1,292
West Virginia	560	810	856	868	1,683	1,632
Iron and steel, blast furnaces:						
Pennsylvania	463	502	635	727	1,776	1,167
Alabama	285	394	602	563	1,470	1,006
Iron and steel, steel works and rolling mills:						
Pennsylvania	519	516	643	646	1,616	918
Ohio	553	599	719	731	1,778	1,004
Foundry and machine-shop products:						
Ohio	531	563	676	692	1,449	1,026
New York	592	601	722	727	1,409	1,040
Agricultural implements:						
Illinois	464	519	601	722	1,201	980
Indiana	452	485	550	596	1,321	846
Electrical machinery, apparatus, and supplies:						
New York	461	462	581	555	1,045	768
Illinois	476	516	716	743	1,177	1,122
Chemicals:						
New Jersey	537	559	624	671	1,288	1,167
New York	503	557	611	669	1,394	1,093

TABLE 46.—ESTIMATED AMOUNTS OF ACTUAL MONEY EARNINGS, PER CAPITA, IN 14 SELECTED INDUSTRIES, BY SELECTED STATES, *WOMEN*: 1899–1921

INDUSTRY AND STATE	1899	1904	1909	1914	1919	1921
Tobacco, cigars and cigarettes:						
Florida	$238	$287	$288	$300	$496	$463
Pennsylvania	218	228	233	236	510	468
Clothing, men's:						
New York	305	305	351	349	854	865
Illinois	262	318	321	385	868	952
Clothing, women's:						
New York	347	362	443	455	998	1,046
Illinois	253	346	398	420	813	829
Cotton manufactures:						
Massachusetts	320	322	398	407	874	824
North Carolina	153	184	242	268	642	527
Knit goods:						
Pennsylvania	250	259	298	349	629	720
New York	322	323	405	422	756	840
Shirts:						
New York	305	297	360	354	674	741
Pennsylvania	214	234	266	269	412	450
Silk goods, including throwsters:						
Pennsylvania	232	267	342	385	735	808
New Jersey	358	360	451	495	930	946
Woolen goods:						
Massachusetts	280	309	352	379	797	808
Pennsylvania	284	280	339	365	832	769
Worsted goods:						
Massachusetts	286	296	359	384	758	777
Pennsylvania	267	285	328	361	806	772
Boots and shoes, not including rubber boots and shoes:						
Massachusetts	373	413	461	484	861	875
Missouri	323	383	456	437	718	833
Printing and publishing, newspapers and periodicals:						
New York	311	344	389	409	630	806
Illinois	204	267	283	294	472	665
Printing and publishing, book and job:						
New York	336	348	397	413	791	947
Illinois	268	313	358	394	715	821
Glass:						
Pennsylvania	248	294	278	295	593	502
West Virginia	127	183	194	197	381	370
Electrical machinery, apparatus, and supplies:						
New York	230	231	289	277	521	383
Illinois	256	277	384	399	631	602

FREQUENCY DISTRIBUTION OF INDUSTRIES

The figures that have been presented in certain of the preceding tables to show the amounts of money earnings per capita in the 41 selected industries and in the 48 States, are not easily grasped as to their general drift even with the help of charts. For this reason the device of the frequency distribution has been utilized. The results of the application of this device to the data on money earnings of male wage earners are presented in Table 47. The statistical unit in this table is the industry, or rather its industry average. This industry average is an estimated sum purporting to represent the per capita annual earnings received by the workers in an industry. For example, in Table 47, it appears that in 1899 there was one industry (in this case it happens to be woolen and worsted goods) in which the average (i. e., the per capita) annual money earnings fell between $300 and $325. The table was constructed by drawing off on cards the estimated amounts of earnings, using one card for

each industry, and then, for each census year, arranging the cards in the order of the increasing amounts of these earnings. The number of cards in each classified group was then indicated in the table.

There are very definitely evident in Table 47 two main concentration groups, one representing the period of relatively low money earnings from 1899 to 1914, and the other group, including the census years 1919, 1921, and 1923, covering a shorter period, wherein very

TABLE 47.—FORTY-ONE SELECTED INDUSTRIES ARRANGED ACCORDING TO THE ESTIMATED AMOUNTS OF PER CAPITA MONEY EARNINGS OF ADULT MALE WORKERS IN EACH INDUSTRY, CENSUS YEARS: 1899–1923

MONEY EARNINGS PER CAPITA	NUMBER OF INDUSTRIES[1]								MONEY EARNINGS PER CAPITA	NUMBER OF INDUSTRIES[1]			
	1899[2]	1904	1909	1914	1919	1921	1923	All yrs.		1919	1921	1923	All yrs.
$300–$324	1							1	$1,075–$1,099	3	1	2	6
$325–$349	1							1	$1,100–$1,124	1	2	1	4
$350–$374	3							3	$1,125–$1,149		1		1
$375–$399	1	3						4	$1,150–$1,174	2	4		6
$400–$424	4	3						7	$1,175–$1,199	4			4
$425–$449	7	3	2					12	$1,200–$1,224	1		1	2
$450–$474	4	6	2	1				13	$1,225–$1,249	2	3	2	7
$475–$449	4	5	3	2				14	$1,250–$1,274	3	1	2	6
$500–$524	2	4	5	2				13	$1,275–$1,299	2	2	4	8
$525–$549	3	3	3	6				15	$1,300–$1,324				
$550–$574	2	2	3	3				10	$1,325–$1,349	2	3	1	6
$575–$599	4	5	6	3				18	$1,350–$1,374		2	2	4
$600–$624	1	3	3	6				13	$1,375–$1,399	2		1	3
$625–$649	1	2	2	3				8	$1,400–$1,424	1			1
$650–$674	1		4	5				10	$1,425–$1,449				
$675–$699		2	2	2				6	$1,450–$1,474	2		2	4
$700–$724			3					3	$1,475–$1,499	1			1
$725–$749			2	2		1		5	$1,500–$1,524	1		5	6
$750–$774			1	2				3	$1,525–$1,549				
$775–$799				3		1		4	$1,550–$1,574			1	1
$800–$824				1				1	$1,575–$1,599	1		3	4
$825–$849						1		1	$1,600–$1,624	1		2	3
$850–$874					1	1		2	$1,625–$1,649				
$875–$899						2		2	$1,650–$1,674		1	3	4
$900–$924					1	1		2	$1,675–$1,699		1		1
$925–$949					1		1	2	$1,700–$1,724				
$950–$974					1			1	$1,725–$1,749	1	1	1	3
$975–$999						3		3	$1,750–$1,774		1	1	2
$1,000–$1,024					3	2		5	$1,775–$1,799	1			1
$1,025–$1,049					1	4		5	$1,800–$2,024			5	5
$1,050–$1,074					2	2	1	5					

[1] The figures indicate the number of industries in which the estimated average of annual money earnings falls within the class limits indicated in the scale at the left.
[2] Thirty-nine industries; no data available in 1899 census for "Automobiles, bodies and parts"; and "Chemicals."

much higher money earnings were paid. Not only were the money earnings in this latter period very much higher but it appears that there was less uniformity among the industries. It is, of course, possible that this difference in the spread as between the two periods is more apparent than real. The reason for entertaining some doubt on this point has to do with the character of the unit. That unit is an average, and a frequency distribution of these averages is, in effect, an attempt to average averages, and such an attempt is

scarcely justifiable if there is any other way in which our objective can be reached.

It is because of the fact that the final and indivisible unit, behind which this inquiry can not go, since the basic material does not allow of it, is the census average wage,[1] that it has seemed necessary to use it even in the somewhat dubious way in which we are using it now. At the same time the limitations of the resulting figures should be clearly realized. Each one of the figures in Table 47 is an average which may contain actual sums of earnings received by individual wage earners, transcending either the upper or the lower limits of the class to which it refers, possibly even transcending both. For example, in 1914 it appears that in 6 of the 41 selected industries the per capita earnings were between $525 and $550 a year. Each one of those six averages may have contained numerous wage earners having during the year 1914 earnings above $550 and numerous others may have had during the year earnings below $525. Therefore the wider spread of the figures at the latter part of the period can at best be considered merely presumptive evidence of a lower degree of uniformity in earnings. To the degree that actual individual earnings within the individual establishments and within the individual industries cluster closely around the average, to that degree does the indicated range of the figures in Table 47 reflect differences in uniformity between individual wage earners.

In Table 48 a summary is made of the 285 industry averages, showing the pre-war period separately from the postwar period. Even the larger brackets used in Table 47 fail to bring out any distinct central tendency for the period as a whole. However, when pre-war and postwar periods are grouped separately, fairly definite

TABLE 48.—DISTRIBUTION OF 162 INDUSTRY AVERAGES (OF MONEY EARNINGS) IN THE PRE-WAR, AND 123 INDUSTRY AVERAGES IN THE POSTWAR, PERIODS, ACCORDING TO THE ESTIMATED PER CAPITA AMOUNTS OF MONEY INCOME

MONEY INCOME PER CAPITA (DOLLARS)	DISTRIBUTION OF INDUSTRY AVERAGES			MONEY INCOME PER CAPITA (DOLLARS)	DISTRIBUTION OF INDUSTRY AVERAGES	
	1899, 1904, 1909, and 1914	1919, 1921, and 1923	All census years		1919, 1921, and 1923	All census years
Total cases	162	123	285	$1,100–$1,199	15	15
				$1,200–$1,299	23	23
$300–$399	9		9	$1,300–$1,399	13	13
$400–$499	46		46	$1,400–$1,499	6	6
$500–$599	56		56	$1,500–$1,599	11	11
$600–$699	37		37			
				$1,600–$1,699	8	8
$700–$799	13	2	15	$1,700–$1,799	6	6
$800–$899	1	5	6	$1,800–$1,899	2	2
$900–$999		8	8	$1,900–$1,999	2	2
$1,000–$1,099		21	21	$2,000–$2,099	1	1

[1] See initial paragraph, Ch. XIII, p. 269.

modes appear. It would perhaps be fair to say for the earlier period that the "style in averages" of money earnings was then between $500 and $600; for the later period one is scarcely warranted in saying that there was any definite style; if there was any such it would appear to lie between $1,000 and $1,300.

PERCENTILE DISTRIBUTIONS

At the same time that Table 47 was prepared, the cards used in its construction and in the preparation of similar tables in later chapters were handled in a slightly different fashion to obtain the results shown in Table 49 which (by the arrangement used in Table 25, above) reports the median, decil, and extreme averages of annual money earnings for each census year. The figures in each census-

TABLE 49.—MEDIAN, DECIL, AND EXTREME INDUSTRY AVERAGES OF ANNUAL MONEY EARNINGS,[1] CENSUS YEARS: 1899–1925

[This table is based on arrays of the 41 industry averages. When the series of averages of annual earnings for any year is arranged in order of increasing (or decreasing) amounts, the decils are spotted as the particular averages in the array which divide the whole number of averages for that year into 10 equal parts]

	1899 [2]	1904	1909	1914	1919	1921	1923	1925 [2]
Highest average	$657	$695	$750	$802	$1,777	$1,771	$2,012	$2,111
Ninth decil	590	606	711	758	1,513	1,361	1,857	1,792
Eighth decil	555	590	671	695	1,420	1,326	1,667	1,672
Seventh decil	509	560	637	663	1,330	1,239	1,606	1,621
Sixth decil	478	525	611	641	1,263	1,165	1,561	1,516
Median	461	504	583	616	1,223	1,103	1,504	1,448
Fourth decil	447	483	561	591	1,174	1,042	1,369	1,371
Third decil	430	465	523	552	1,088	1,017	1,282	1,257
Second decil	408	434	507	532	1,043	978	1,251	1,150
First decil	365	401	451	511	954	869	1,121	1,092
Lowest average	306	380	426	458	866	742	947	978

[1] Of male wage earners. [2] Thirty-nine industries.

year column are obtained directly from cards bearing the estimated amounts of per capita earnings, one card being allotted to an industry and the cards being arranged, as explained above, in the order of increasing amounts of earnings. The table is then constructed by first transferring, to the line marked "lowest average," on the table, the amount found on the lowest card, then the amount on the card which occupies a position one-tenth of the way through the pack, in this case the fourth card; then the amount found on the card which occupies a position three-tenths of the way through the pack; then the amount found on the card which occupies a position four-tenths of the way through the pack; then the amount entered on the midmost card, this being the median average (if such a phrase may be permitted) and so on through the pack until the last card is reached, which card will, of course, bear the highest amount of earnings of all of the 41 industries. The cards are rearranged for each of the census years and the results transcribed in the same way for

the successive census years, the deciles being spotted as the particular averages in the array which divide the whole number of averages for that year into 10 equal parts. Here again allowance should be made for the fact that the figures in the table are, after a fashion, averages of averages. Despite this anomalous character, it is believed that they throw some light on the degree of concentration, or absence of it, in the amounts of per capita earnings. The general drift underlying the figures in Table 49 is brought out somewhat more clearly, perhaps, by Figure 15, on the opposite page.

If the reporting of each of the 41 industries for each census year from 1899 to 1923 results in an array of figures difficult to size up at a glance, so also must corresponding arrays involving the 48 States be difficult to grasp. In Tables 50, 51, and 57, therefore, the distribution of State averages of money earnings per capita is shown in the way already described for industry averages. Table 57, on pages 126 and 127, below, shows, for the 48 States and the District of Columbia, their distribution and the distribution of the wage earners employed within their several boundaries according to the estimated amounts of money earnings, per capita, for all industries combined. In the first column, for each census year, is given the distribution of States and in the footnotes the names of the States are listed. This notation of the identity of the States is included in order to make it possible to judge of the industrial importance of the groups of States in the frequency distribution. Thus, in 1899, the two States wherein per capita money earnings in all industries combined were between $150 and $200 were North Carolina and South Carolina, two States of relatively little importance industrially. If one of those States had been New York, that would of course have meant, in terms of numbers of wage earners, a decided concentration of earnings in this very low group. As a matter of fact, a little study of the figures in Table 57 will show that in each census year there is a rather marked concentration of wage earners at central points in the distributions. This concentration is much more complete in the pre-war, than in the postwar census years. In 1899 we find that the per capita earnings received by 52.3 per cent of all manufacturing wage earners, employed in 12 States, were between $450 and $500; in 1904 the greatest concentration was in the same income class, with 52.6 per cent of the wage earners in 10 States falling within the class; in 1909 the style in per capita earnings moved up a couple of notches, to the $550–$600 group, in which 49.5 per cent of the wage earners (and 12 States) were included; in 1914 the mode was at the same level as in 1909, but with more dispersion; 36 per cent of the wage earners in 6 States getting per capita incomes between $550 and $600.

As already stated, the postwar census years 1919, 1921, and 1923 are marked by a much wider scattering of per capita earnings. In

1919 one-fourth of the wage earners were employed in five States where the per capita earnings were between $1,300 and $1,350; another one-fourth of them were employed in four States where the per capita earnings were between $1,450 and $1,500. In 1921, 23

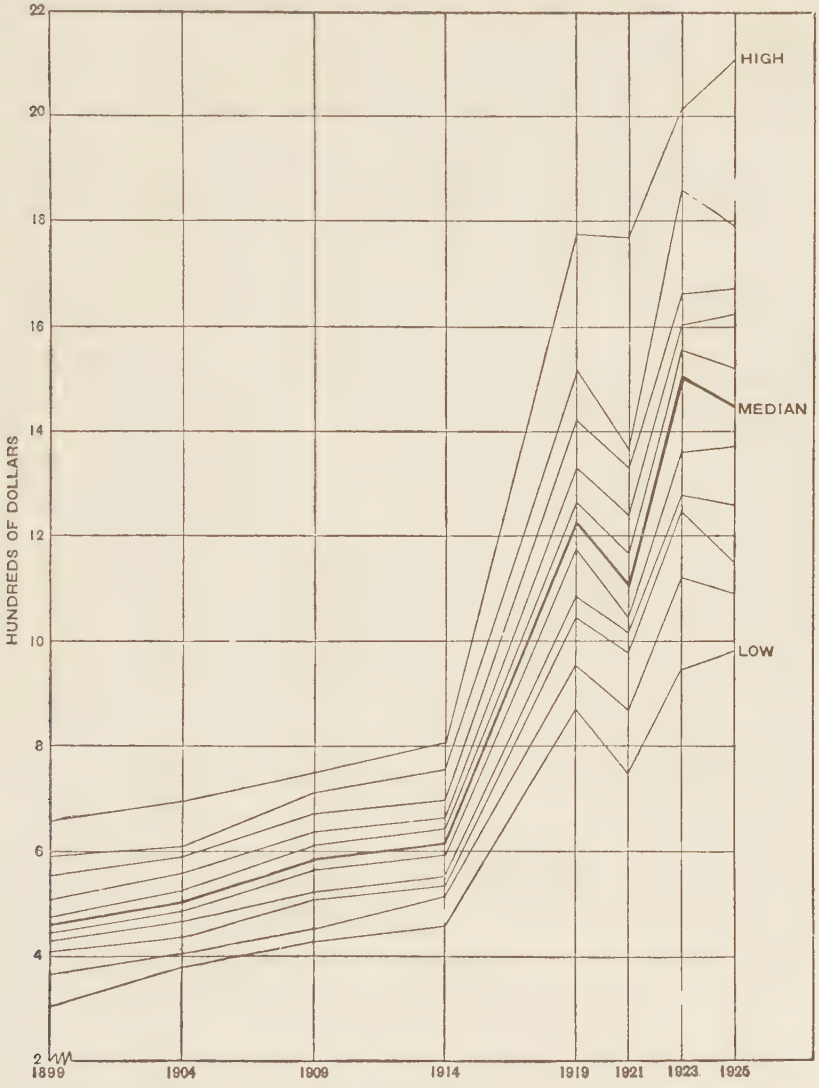


FIG. 15.—MEDIAN, DECIL, AND EXTREME INDUSTRY AVERAGES OF MONEY EARNINGS: 1899–1925

per cent of the wage earners were employed in four States where per capita earnings were between $1,000 and $1,050. In 1923, 26 per cent of the wage earners were employed in three States where per capita earnings were between $1,350 and $1,400. It is apparent

from Table 57, what was noticed about Table 47, that there is a marked division of the concentration array. As before, the postwar earnings seem to be less closely grouped about a typical average.

The median, decil, and extreme State averages of money earnings are presented in Table 50, and shown graphically in Figure 16. The range of figures seems to reinforce the impression, which has remained somewhat nebulous because of the character of the unit employed, that there is a wider variation as between different States than

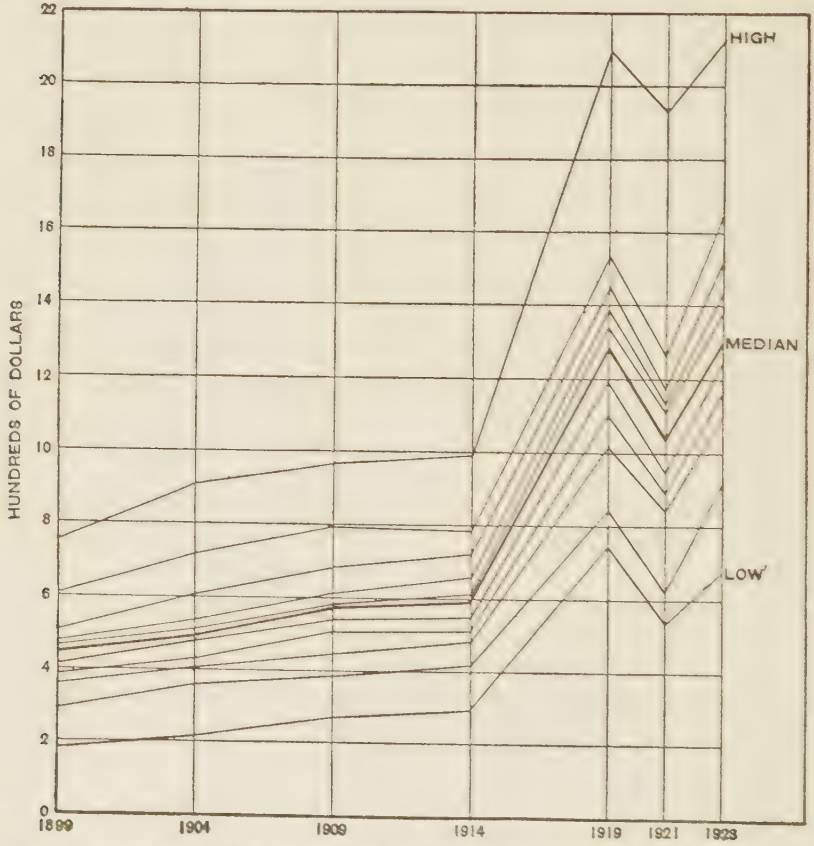


FIG. 16.—MEDIAN, DECIL, AND EXTREME STATE AVERAGES OF MONEY EARNINGS: 1899–1923

between different industries. Table 51 is a summary of the distribution of 196 State averages from the pre-war period and 147 from the postwar period. The difference between the distribution of earnings classified on the industry basis, and their classification on the regional basis, is indicated in summary Table 52, which is made up of the summary columns of Tables 48 and 52. The fluctuating character of our medium of exchange makes it altogether very unlikely that there would be a very pronounced approach to normal distribution

in the case of money earnings, when that distribution involves the consolidation of earnings items over a period of time as long as that here under consideration. Consequently any further discussion of frequency distribution will be deferred to later chapters, wherein similar distributions are made of items of real earnings, which by their very nature lend themselves more readily to comparisons over long periods of time.

TABLE 50.—MEDIAN, DECIL, AND EXTREME STATE AVERAGES OF MONEY EARNINGS, CENSUS YEARS: 1899–1923

[This table is based on arrays of the 49 State averages. When the series of State averages of annual money earnings is arranged in the order of their increasing (or decreasing) amounts, the decils are spotted as the particular averages in the array which divide the whole number of averages for that year into 10 equal parts]

	1899	1904	1909	1914	1919	1921	1923
Highest average	$753	$919	$968	$991	$2,099	$1,933	$2,128
Ninth decil	605	715	797	787	1,530	1,261	1,641
Eighth decil	501	603	684	720	1,447	1,177	1,524
Seventh decil	474	539	611	659	1,387	1,129	1,426
Sixth decil	460	502	577	609	1,338	1,106	1,376
Median	449	492	573	592	1,283	1,041	1,297
Fourth decil	415	480	544	546	1,195	946	1,244
Third decil	386	435	503	506	1,102	899	1,157
Second decil	359	402	449	480	1,019	847	1,091
First decil	297	359	386	414	844	628	911
Lowest average	183	214	270	297	747	540	678

TABLE 51.—DISTRIBUTION OF 343 STATE AVERAGES OF MONEY EARNINGS IN PRE-WAR AND POSTWAR PERIODS

MONEY EARNINGS PER CAPITA (DOLLARS)	DISTRIBUTION OF STATE AVERAGES			MONEY EARNINGS PER CAPITA (DOLLARS)	DISTRIBUTION OF STATE AVERAGES	
	1899, 1904, 1909, and 1914	1919, 1921, and 1923	All census years		1919, 1921, and 1923	All census years
Total cases	196	147	343	$1,100–$1,149	18	18
				$1,150–$1,199	8	8
$150–$199	4		4	$1,200–$1,249	8	8
$200–$249	2		2	$1,250–$1,299	10	10
$250–$299	5		5	$1,300–$1,349	10	10
$300–$349	6		6			
$350–$399	19		19	$1,350–$1,399	8	8
				$1,400–$1,449	8	8
$400–$449	24		24	$1,450–$1,499	8	8
$450–$499	30		30	$1,500–$1,549	5	5
$500–$549	26	1	27	$1,550–$1,599	2	2
$550–$599	23	2	25			
$600–$649	15	2	17	$1,600–$1,649	3	3
				$1,650–$1,699	2	2
$650–$699	9	2	11	$1,700–$1,749	1	1
$700–$749	12	4	16	$1,750–$1,799		
$750–$799	9	4	13	$1,800–$1,849		
$800–$849	3	4	7			
$850–$899	4	7	11	$1,850–$1,899		
				$1,900–$1,949	2	2
$900–$949	3	8	11	$1,950–$1,999		
$950–$999	2	5	7	$2,000–$2,049	1	1
$1,000–$1,049		8	8	$2,050–$2,099	1	1
$1,050–$1,099		4	4	$2,100–$2,149	1	1

TABLE 52.—COMPARISON OF DISTRIBUTION OF 285 INDUSTRY AVERAGES AND 343 STATE AVERAGES OF MONEY EARNINGS, PER CAPITA, ALL CENSUS YEARS COMBINED: 1899–1923

ANNUAL MONEY EARNINGS (DOLLARS)	DISTRIBUTION OF—		PERCENTAGE DISTRIBUTION		ANNUAL MONEY EARNINGS (DOLLARS)	DISTRIBUTION OF—		PERCENTAGE DISTRIBUTION	
	Industry averages	State averages	Industry averages	State averages		Industry averages	State averages	Industry averages	State averages
Total cases	285	343	100.0	100.0	$1,100–$1,199	15	26	5.3	8.0
					$1,200–$1,299	23	18	8.0	5.0
$100–$199	---	4	---	1.3	$1,300–$1,399	13	18	4.6	5.0
$200–$299	---	7	---	2.0	$1,400–$1,499	6	16	2.0	5.0
$300–$399	9	25	3.0	7.7	$1,500–$1,599	11	7	4.0	2.0
$400–$499	46	54	16.0	15.5					
$500–$599	56	51	19.6	15.0	$1,600–$1,699	8	5	2.8	1.5
					$1,700–$1,799	6	1	2.0	.2
$600–$699	37	28	13.0	8.2	$1,800–$1,899	2	0	.7	.0
$700–$799	15	29	5.3	8.8	$1,900–$1,999	2	2	.7	.5
$800–$899	6	18	2.0	5.3	$2,000–$2,099	1	2	.3	.5
$900–$999	8	18	2.8	5.0	$2,100–$2,199	---	1	---	.2
$1,000–$1,099	21	12	7.3	3.9					

PER CAPITA HOURLY EARNINGS

For the most part, the results presented in this monograph are put in the form of annual earnings. However, as a by-product of the first attempts to devise an adequate employment index for discounting full-time earnings, we have some data on prevailing hours worked per week. These, in conjunction with our data on full-time weekly earnings have made it possible to compute, in the manner described in Chapter XVIII, nominal, hourly earnings per capita. These estimates, classified by sex and age groups for each census year, are given in Table 53. The figures reveal the same wide differences between the earnings of men, women, and children as were revealed in the corresponding tables showing annual earnings by sex and age groups. They also show the very large increases in nominal hourly earnings which have taken place since 1899. These increases do not exactly correspond to the increases in annual earn-

TABLE 53.—ESTIMATED AMOUNTS OF NOMINAL HOURLY EARNINGS, PER CAPITA, IN THE UNITED STATES, ALL INDUSTRIES COMBINED, BY SEX AND AGE GROUPS, CENSUS YEARS: 1899–1921

CENSUS YEAR	HOURLY EARNINGS			
	All groups	Men 16 years of age and over	Women 16 years of age and over	Children under 16
	CENTS PER HOUR			
1899	17.3	19.29	10.33	5.9
1904	20.0	22.30	11.95	6.8
1909	22.2	24.79	13.28	7.5
1914	25.6	28.62	15.32	8.7
1919	55.3	61.81	33.11	18.8
1921	57.0	63.69	34.12	19.4

ings, because annual earnings are affected by unemployment, whereas hourly earnings are not so affected. The working hour is a definite length of time. It is the only unit of time payment which accurately measures time expended in labor; the day is vague because a workday may be a 6-hour day, an 8-hour day or a 12-hour day; the week is equally vague for similar reasons; the month is a period which may include a varying number of working days and finally, to an even greater extent, the year represents an unknown quantity so far as the amount of labor time included in it is concerned. When the hour is taken as the unit of earnings, it becomes synonymous with rates; that is to say, hourly earnings are the same as hourly rates, and the amount of time at different periods reflects simultaneously changes in hourly earnings and changes in hourly rates.

In Table 54 nominal hourly earnings are summarized for the nine geographic divisions, in Table 55 hourly earnings are reported by

TABLE 54.—ESTIMATED AMOUNTS OF NOMINAL HOURLY EARNINGS IN THE UNITED STATES, ALL INDUSTRIES COMBINED, BY GEOGRAPHIC DIVISIONS, CENSUS YEARS: 1899–1921

GEOGRAPHIC DIVISION	1899	1904	1909	1914	1919	1921
	CENTS PER HOUR					
United States	17.26	19.96	22.19	25.60	55.30	57.00
New England	17.16	19.21	21.15	23.59	49.94	51.55
Middle Atlantic	18.39	20.58	22.82	25.62	58.25	60.26
East North Central	18.54	21.94	24.10	29.16	61.31	[64.15
West North Central	18.26	21.61	23.81	27.52	52.21	59.80
South Atlantic	11.28	13.64	15.18	18.04	43.38	40.23
East South Central	12.28	15.23	15.84	18.65	39.89	38.65
West South Central	13.57	17.46	17.99	21.30	42.48	43.46
Mountain	24.21	29.71	30.58	34.32	58.29	65.24
Pacific	20.96	26.97	30.53	33.06	67.26	69.96

selected industries for male wage earners and in Table 56 corresponding capita hourly earnings for women wage earners in such of the 41 selected industries as have been reported for women. In both Table 55 and Table 56 an extremely wide variation is evident not only between successive periods of time, but also, even more noticeably, between different industries. Both of these sorts of variation are to be expected. It seems evident that the variation in the amounts of hourly earnings is really less than is shown for the same industries in tables already given for annual earnings. In the case of both men and women, one would scarcely look for as much in hourly earnings as one would expect to prevail in annual earnings, if only because of the fact that annual earnings are subject to certain disturbing factors to which hourly earnings are not liable, such as the vicissitudes of the business cycle, with the attendant unemployment, irregular employment, and short time which these fluctuations produce.

TABLE 55.—ESTIMATED AMOUNTS OF NOMINAL HOURLY EARNINGS, BY SELECTED INDUSTRIES, MEN WAGE EARNERS ONLY, CENSUS YEARS: 1899–1921

INDUSTRY	1899	1904	1909	1914	1919	1921
	CENTS PER HOUR					
All industries	19.3	22.3	24.8	28.6	61.8	63.7
Bread and other bakery products	17.69	21.27	18.90	27.30	54.33	64.65
Flour-mill and gristmill products	22.23	23.20	25.24	29.25	57.53	63.45
Confectionery	19.80	22.00	24.19	28.32	54.04	61.76
Liquors, malt	25.15	28.90	30.82	36.81	57.41	69.47
Mineral and soda waters	15.84	17.82	18.82	20.82	36.08	44.03
Tobacco, cigars and cigarettes	18.34	19.93	21.06	24.41	43.09	23.64
Carpets and rugs, other than rag	17.94	19.71	44.52	23.83	57.97	70.26
Shirts	19.53	21.04	23.74	26.42	51.84	58.61
Clothing, men's	23.32	26.82	30.54	40.38	90.27	97.83
Clothing, women's	23.11	27.09	31.69	35.30	88.17	95.80
Cotton manufactures						
Dyeing and finishing textiles, exclusive of that done in textile mills	18.02	19.01	21.23	23.53	52.78	58.17
Knit goods	15.47	16.54	18.91	22.86	45.25	50.87
Silk goods, including throwsters	20.00	21.55	22.97	28.56	63.82	69.42
Woolen and worsted goods						
Boots and shoes, not including rubber boots and shoes	22.61	26.03	28.57	32.41	65.61	73.79
Leather, tanned, curried, and finished	16.64	18.89	20.95	23.50	56.44	54.25
Furniture	19.49	22.34	25.51	22.61	54.78	64.03
Lumber and timber products	13.66	17.66	17.14	19.61	42.64	36.01
Lumber, planing-mill products, not including planing mills connected with sawmills	19.02	22.65	25.22	29.17	49.94	60.28
Paper and wood pulp	14.40	17.32	19.40	22.52	51.22	51.67
Printing and publishing, book and job	23.54	27.83	32.64	37.34	62.07	84.10
Printing and publishing, newspapers and periodicals	24.76	29.49	32.92	37.62	58.65	80.53
Chemicals		20.29	22.48	26.07	57.68	57.79
Petroleum refining	20.48	23.01	27.61	30.21	68.63	73.35
Brick and tile, terra-cotta, and fire-clay products						
Glass	24.70	29.32	28.96	34.44	64.56	71.74
Iron and steel, blast furnaces	15.15	18.01	21.60	27.50	69.31	61.77
Iron and steel, steel works and rolling mills	21.48	23.62	27.61	31.83	76.68	79.84
Foundry and machine-shop products	24.50	28.32	30.81	34.33	70.27	71.79
Automobile bodies and parts		20.12	23.95	28.94	57.81	60.24
Automobiles	23.16	24.68	26.83	36.58	68.75	72.59
Cars, steam-railroad, not including operations of railroad companies	19.11	23.49	25.05	31.26	66.55	66.80
Electric-railroad repair shops	25.11	26.48	27.21	30.68	58.69	68.05
Steam-railroad repair shops	23.05	26.19	28.43	31.74	70.74	80.62
Agricultural implements	19.73	22.39	24.38	31.48	57.18	63.67
Shipbuilding, steel	19.49	21.88	24.05	32.01	79.20	73.59
Electrical machinery, apparatus, and supplies	20.64	23.20	25.23	28.44	55.97	61.28

TABLE 56.—ESTIMATED AMOUNTS OF NOMINAL HOURLY EARNINGS, BY SELECTED INDUSTRIES, FOR WOMEN WAGE EARNERS ONLY, CENSUS YEARS: 1899–1921

INDUSTRY	1899	1904	1909	1914	1919	1921
	CENTS PER HOUR					
All industries	10.3	12.0	13.3	15.3	33.1	34.1
Bread and other bakery products	8.33	10.02	11.74	12.85	25.69	30.46
Confectionery	9.17	10.19	11.20	13.12	25.04	28.61
Mineral and soda water	8.04	9.05	9.56	12.17	18.32	22.36
Tobacco, cigars and cigarettes	10.17	11.06	11.70	13.55	23.92	24.35
Carpets and rugs, other than rag	11.49	12.63	14.39	15.27	37.13	46.87
Shirts	10.62	11.45	12.92	14.38	28.26	31.90
Clothing, men's	11.35	12.50	14.24	15.18	39.59	47.80
Clothing, women's	12.21	14.31	16.74	18.64	46.58	50.59
Dyeing and finishing textiles	10.88	11.47	12.81	14.20	31.85	35.11
Knit goods	10.38	11.10	12.69	15.35	30.37	34.13
Silk goods	11.81	12.72	14.60	15.03	37.68	40.99
Boots and shoes, not including rubber boots and shoes	13.81	15.90	17.44	19.80	40.04	45.05
Printing and publishing, book and job	11.88	14.05	16.49	18.85	31.34	42.47
Printing and publishing, newspapers and periodicals	11.17	13.30	14.84	16.96	26.45	36.31
Glass	7.93	9.41	9.29	11.05	20.72	23.03
Electrical machinery, apparatus, and supplies	11.16	12.55	13.66	15.40	30.28	33.15

TABLE 57.—THE 48 STATES AND THE DISTRICT OF COLUMBIA, AND THE WAGE EARNERS EMPLOYED THEREIN, DISTRIBUTED ACCORDING TO THE AMOUNT OF ANNUAL MONEY EARNINGS, PER CAPITA, ALL INDUSTRIES COMBINED, MANUFACTURES CENSUS YEARS: 1899–1923

ANNUAL MONEY EARNINGS PER CAPITA (DOLLARS)	NUMBER OF STATES IN EACH EARNINGS GROUP AND PERCENTAGE BORNE BY AGGREGATE AVERAGE NUMBER OF WAGE EARNERS IN THAT GROUP OF STATES TO TOTAL NUMBER OF WAGE EARNERS IN ALL MANUFACTURING INDUSTRIES							
	1899		1904		1909		1914	
	States[1]	Per cent	States[2]	Per cent	States[3]	Per cent	States[4]	Per cent
$150–$199	[a] 2	2.24	[a] 2	2.65				
$200–$249	[b] 1	1.58	[b] 1	1.72				
$250–$299	[c] 2	1.00			[a] 2	2.94	[a] 1	1.94
$300–$349	[d] 3	3.32			[b] 1	1.58	[b] 2	2.50
$350–$399	[e] 9	8.61	[c] 5	5.03	[c] 4	4.08	[c] 1	.66
$400–$449	[f] 8	19.83	[d] 9	9.89	[d] 3	3.23	[d] 4	4.24
$450–$499	[g]12	52.31	[e]10	52.60	[e] 3	3.69	[e] 5	4.71
$500–$549	[h] 4	7.93	[f] 8	17.10	[f] 7	14.72	[f] 7	17.26
$550–$599	[i] 2	2.35	[g] 3	7.02	[g]12	49.50	[g] 6	36.02
$600–$649	[j] 2	.75	[h] 3	.55	[h] 4	16.02	[h] 6	15.32
$650–$699			[i] 1	1.89	[i] 3	.15	[i] 5	8.98
$700–$749	[k] 3	.29	[j] 3	1.29	[j] 1	.18	[j] 5	4.90
$750–$799	[l] 1	.01	[k] 1	.03	[k] 5	3.75	[k] 2	2.94
$800–$849			[l] 1	.09	[l] 2	.14		
$850–$899			[m] 1	.01			[l] 3	.33
$900–$949			[n] 1	.16	[m] 1	.18	[m] 1	.13
$950–$999					[n] 1	.03	[n] 1	.05
Total number of wage earners, all manufacturing industries	4,712,763		5,468,383		6,615,046		7,036,247	

(See pages 126 and 127 for footnotes.)

TABLE 57.—THE 48 STATES AND THE DISTRICT OF COLUMBIA, AND THE WAGE EARNERS EMPLOYED THEREIN, DISTRIBUTED ACCORDING TO THE AMOUNT OF ANNUAL MONEY EARNINGS, PER CAPITA, ALL INDUSTRIES COMBINED, MANUFACTURES CENSUS YEARS: 1899–1923—Continued

ANNUAL MONEY EARNINGS PER CAPITA (DOLLARS)	NUMBER OF STATES IN EACH EARNINGS GROUP AND PERCENTAGE BORNE BY AGGREGATE AVERAGE NUMBER OF WAGE EARNERS IN THAT GROUP OF STATES TO TOTAL NUMBER OF WAGE EARNERS IN ALL MANUFACTURING INDUSTRIES					
	1919		1921		1923	
	States[1]	Per cent	States[6]	Per cent	States[7]	Per cent
$500–$549			[a] 1	1.10		
$550–$599			[b] 2	3.37		
$600–$649			[c] 2	1.09		
$650–$699					[a] 2	2.67
$700–$749	[a] 1	0.87	[d] 2	2.28	[b] 1	1.98
$750–$799	[b] 1	1.73	[e] 2	2.00	[c] 1	.62
$800–$849	[c] 2	2.41	[f] 1	1.27	[d] 1	.51
$850–$899	[d] 2	1.18	[g] 5	14.34		
$900–$949			[h] 6	5.08	[e] 2	2.29
$950–$999	[e] 3	3.02			[f] 2	1.99
$1,000–$1,049	[f] 3	3.31	[i] 4	22.95	[g] 1	1.27
$1,050–$1,099	[g] 1	.10	[j] 1	14.40	[h] 2	2.03
$1,100–$1,149	[h] 4	3.03	[k]11	15.36	[i] 3	3.37
$1,150–$1,199	[i] 3	8.23	[l] 2	1.19	[j] 3	9.44
$1,200–$1,249	[j] 1	.97	[m] 4	12.01	[k] 3	5.50
$1,250–$1,299	[k] 4	6.06	[n] 2	.44	[l] 4	1.71
$1,300–$1,349	[l] 5	21.69	[o] 1	2.86	[m] 4	4.42
$1,350–$1,399	[m] 4	8.45	[p] 1	.16	[n] 3	25.85
$1,400–$1,449	[n] 5	4.03			[o] 3	9.69
$1,450–$1,499	[o] 4	20.34			[p] 4	1.22
$1,500–$1,549	[p] 1	.15	[q] 1	.03	[q] 3	15.41
$1,550–$1,599	[q] 2	9.49				
$1,600–$1,649					[r] 3	4.26
$1,650–$1,699	[r] 1	5.18			[s] 1	5.74
$1,700–$1,749					[t] 1	.19
$1,750–$1,799						
$1,800–$1,849						
$1,850–$1,899						
$1,900–$1,949			[r] 1	.10	[u] 1	.05
$1,950–$1,999						
$2,000–$2,049	[s] 1	.07				
$2,050–$2,099	[t] 1	.09				
$2,100–$2,149					[v] 1	.08
Total number of wage earners, all manufacturing industries	9,096,372		6,946,570		8,778,156	

[1] The States represented by the numbers in this column are:
- [a] North Carolina, South Carolina.
- [b] Georgia.
- [c] Arkansas, Mississippi.
- [d] Alabama, Virginia, Tennessee.
- [e] Florida, Louisiana, Kentucky, Maryland, Maine, Oklahoma, New Hampshire, Vermont, West Virginia.
- [f] Rhode Island, Delaware, Texas, Michigan, Massachusetts, Wisconsin, District of Columbia, Iowa.
- [g] Missouri, New York, New Jersey, Indiana, Pennsylvania, Connecticut, Ohio, Kansas, Nebraska, Minnesota, North Dakota, New Mexico.
- [h] Utah, Oregon, Illinois, South Dakota.
- [i] California, Washington.
- [j] Colorado, Idaho.
- [k] Wyoming, Montana, Arizona.
- [l] Nevada.

[6] The States represented by the numbers in this column are:
- [a] North Carolina, South Carolina.
- [b] Georgia.
- [c] Virginia, Tennessee, Alabama, Mississippi, Arkansas.
- [d] Maryland, Kentucky, Florida, New Hampshire, Rhode Island, Delaware, Vermont, Louisiana, Maine.
- [e] Massachusetts, Texas, West Virginia, Iowa, Connecticut, New Jersey, New York, Michigan, Pennsylvania, Oklahoma.
- [f] Indiana, Wisconsin, District of Columbia, Missouri, Kansas, Ohio, Nebraska, Minnesota.
- [g] Illinois, South Dakota, North Dakota.
- [h] Utah, New Mexico, Oregon.
- [i] California.
- [j] Washington, Colorado, Idaho.
- [k] Wyoming.
- [l] Arizona.
- [m] Nevada.
- [n] Montana.

[3] The States represented by the numbers in this column are:
[a] North Carolina, South Carolina.
[b] Georgia.
[c] Mississippi, Virginia, Tennessee, Arkansas.
[d] Alabama, Kentucky, Louisiana.
[e] Maryland, New Hampshire, Florida.
[f] Rhode Island, Maine, Delaware, Vermont, Massachusetts, Texas, West Virginia.
[g] Connecticut, New Jersey, Oklahoma, Pennsylvania, Indiana, New York, Missouri, Michigan, Wisconsin, Louisiana, Nebraska, District of Columbia.
[h] Kansas, Ohio, Minnesota, Illinois.
[i] New Mexico, North Dakota, South Dakota.
[j] Utah.
[k] Oregon, Colorado, Idaho, Washington, California.
[l] Arizona, Wyoming.
[m] Montana.
[n] Nevada.

[4] The States represented by the numbers in this column are:
[a] North Carolina.
[b] South Carolina, Georgia.
[c] Mississippi.
[d] Tennessee, Arkansas, Virginia, Alabama.
[e] Kentucky, Florida, Louisiana, Delaware, Maryland.
[f] Rhode Island, New Hampshire, Maine, Vermont, Massachusetts, Texas, Connecticut.
[g] New Jersey, New York, Pennsylvania, District of Columbia, Missouri, Oklahoma.
[h] West Virginia, Wisconsin, Kansas, Indiana, Ohio, Iowa.
[i] Minnesota, Nebraska, Illinois, New Mexico, South Dakota.
[j] Michigan, Utah, North Dakota, Oregon, Colorado.
[k] California, Washington.
[l] Wyoming, Montana, Arizona.
[m] Idaho.
[n] Nevada.

[5] The States represented by the numbers in this column are:
[a] South Carolina.
[b] North Carolina.
[c] Georgia, Tennessee.
[d] Arkansas, Mississippi.
[e] Louisiana, Kentucky, Alabama.
[f] Texas, Florida, Virginia.
[g] District of Columbia.
[h] New Hampshire, Utah, Rhode Island, Vermont.
[i] Oklahoma, Massachusetts, New Mexico.
[j] Maine.
[k] West Virginia, Maryland, Connecticut, Colorado.
[l] New York, Minnesota, California, Wisconsin, Iowa.

Footnote [5]—Continued.
[m] Kansas, North Dakota, Missouri, New Jersey.
[n] Indiana, Montana, Nebraska, Delaware, South Dakota.
[o] Pennsylvania, Oregon, Nevada, Illinois.
[p] Idaho.
[q] Ohio, Washington.
[r] Michigan.
[s] Wyoming.
[t] Arizona.

[6] The States represented by the numbers in this column are:
[a] South Carolina.
[b] North Carolina, Georgia.
[c] Mississippi, Arkansas.
[d] Tennessee, Alabama.
[e] Louisiana, Florida.
[f] Virginia.
[g] New Hampshire, Vermont, Rhode Island, Connecticut, Massachusetts.
[h] Maryland, Delaware, Kentucky, Texas, New Mexico, Maine.
[i] Wisconsin, Penpsylvania, Missouri, New Jersey.
[j] New York.
[k] Kansas, Oregon, Indiana, Minnesota, Oklahoma, Ohio, West Virginia, Utah, Nebraska, District of Columbia, Iowa.
[l] Washington, South Dakota.
[m] Illinois, Arizona, Montana, Michigan.
[n] Colorado, North Dakota.
[o] California.
[p] Idaho.
[q] Nevada.
[r] Wyoming.

[7] The States represented by the numbers in this column are:
[a] South Carolina, Georgia.
[b] North Carolina.
[c] Mississippi.
[d] Arkansas.
[e] Tennessee, Louisiana.
[f] Florida, Alabama.
[g] Virginia.
[h] New Hampshire, Texas.
[i] Vermont, Rhode Island, Maryland.
[j] Maine, Kentucky, Massachusetts.
[k] Missouri, Connecticut, Delaware.
[l] South Dakota, Iowa, Utah, Kansas.
[m] New Mexico, Nebraska, Wisconsin, Minnesota.
[n] Oklahoma, New York, Pennsylvania.
[o] West Virginia, New Jersey, Indiana.
[p] District of Columbia, Oregon, Colorado, North Dakota.
[q] Ohio, Arizona, Illinois.
[r] Montana, Washington, California.
[s] Michigan.
[t] Idaho.
[u] Nevada.
[v] Wyoming.

Chapter V

ESTIMATED AMOUNTS OF REAL EARNINGS

Although they are more significant than wage rates, the money earnings of wage earners, so far as their economic welfare is concerned, are relatively meaningless over long periods of time. It is a commonplace that it is not so much the number of dollars in his pay envelope that counts in the industrial worker's estimate of his own economic well-being as it is the amount of the necessities and comforts of life which he can buy with the accumulation of the money sums which find their way into his pay envelopes in the course of a year of Saturday nights. The natural wages of labor, or its natural earnings, are the pounds of food, the suits of clothes, and the amount and kind of shelter which the wage earner can buy with the money income received for his labor.

It is with the object, then, of measuring the purchasing power of money earnings that the figures presented in this chapter, as well as in Chapter IX in Part III, have been brought together. The standard indexes of the United States Bureau of Labor Statistics, reflecting fluctuations in retail food prices and in the total cost of living, are used as deflation coefficients for the reduction of money earnings to units of uniform purchasing power. The price level which has been taken as a standard in making this deflation is that of 1914. The price level of the year 1913 has been very commonly used for the purpose, notably by the Federal bureau itself. The latter year has the merit of being a year in which there was, by and large, no great extreme of either prosperity or depression. The year 1914 was, on the whole, one of depression and is not, therefore, the best year for the present purposes. But 1913 seems to be unavailable because it was not a census year, and in respect of a large part of this analysis, only census years are included. So far as prevailing business conditions are concerned, it would have been better, perhaps, to have taken the year 1919. However, despite the advantages of the latter year, it was decided to use 1914, because it fell in the middle of the quarter-century period here under review and, what is probably more important, it comes just at the beginning of a period of extraordinarily rapid increase in general prices, including the price of labor.

A summary, showing the amounts in deflated dollars of per capita earnings in the United States as a whole, for all industries combined, by sex and age groups, and for each census year since 1899 is given

in Table 58. These figures represent the numbers of dollars which would have been received in earnings each different census year if the retail price level of 1914 had prevailed throughout the 27-year period from 1899 to 1925. They are, in other words, dollars of constant purchasing power. A comparison of figures in Table 58 with the analogous data for money earnings (Table 40) in the preceding chapter, will show at once how misleading are the dollar amounts presented in the latter table. Thus, the per capita average of $1,398 of money earnings are shown by the figures in Table 58 to be sufficient, at the price level of 1914, to purchase only $836 worth of goods and services. At the other end of the period, in 1899, the per capita average of $446, for all groups and industries combined, would purchase as large a volume of goods as $669 in 1914. It is obvious also that this process of deflation makes a very different showing as to the degree and even as to the direction of change in the real earnings of labor. This relative aspect of the matter, however, is reserved for discussion in a later chapter.

TABLE 58.—THE PURCHASING POWER, IN TERMS OF THE 1914 DOLLAR, OF ANNUAL MONEY INCOME, PER CAPITA, IN THE UNITED STATES, BY SEX AND AGE GROUP, CENSUS YEARS: 1899–1923

CENSUS YEAR	All manufacturing wage earners	Men	Women	Children
1899	$603	$373	$361	$205
1904	582	651	348	198
1909	640	725	390	221
1914	576	644	344	195
1919	677	756	406	230
1921	595	665	356	202
1923	839	924	495	281

A reference to the second and fourth columns of Table 35 in the last chapter will show these census year averages of real and money earnings fitted into a continuous series with the aid of interpolated averages for intercensal years.

REGIONAL DIFFERENCES IN REAL EARNINGS

A different sort of summary of our results on real earnings is given in Table 59. This table shows, for all industries combined, the distribution of the 48 States and the District of Columbia on the basis of the estimated per capita real earnings prevailing in each jurisdiction. The figures given are derived in the same way as described in the preceding chapter for Table 50, except that the arrangement is on the basis of decreasing amounts of "real" instead of money earnings. The meanings of the figures can perhaps be made clearer by use of an illustration. In 1899 the State in which average real earnings per capita were lower than in any other State had per capita

earnings amounting to $247. In the State in which the highest per capita average earnings appear to have been received, those earnings amounted to $1,018. With the States arranged in the order of decreasing average earnings, the midmost State was spotted and the average amount of earnings in it listed in the table as the median item—$607. In similar fashion, the so-called decil items were spotted—that is to say, the items corresponding to States occupying positions in the array of States at points which separate the total number of States into 10 equal parts. The figures serve to show how wide a variation of earnings among States is concealed in the average for the United States as a whole. Unfortunately, of course, they tell us nothing about the other unknown variations, which must be present both in the case of States and of industries—the highly important variations between the amounts received by individual wage earners. The data of Table 59 are charted in Figure 17.

The same arrays of the average earnings items for different States, which were used in construction of Table 59, were utilized in putting together a somewhat more detailed showing of State variations in the purchasing power of manufacturing labor incomes. The results are given in Table 60. The figures given in the left-hand column, under each census year, are the numbers of States in which per capita real earnings fell within the limits indicated by the brackets at the left of the Table. The names of the States represented by these figures are given in a footnote. These frequency distributions put the record for the whole 25-year period on a basis which makes possible some inferences regarding the economic well-being of the manufacturing labor class during the last 25 years.

TABLE 59.—MEDIAN, DECIL, AND EXTREME STATE AVERAGES OF REAL EARNINGS, PER CAPITA, IN EACH CENSUS YEAR: 1899–1923

	1899	1904	1909	1914	1919	1921	1923
Highest average {State	Nev.	Mont.	Nev.	Nev.	Ariz.	Wyo.	Wyo.
Highest average {Amount	$1,018	$1,107	$1,113	$991	$1,173	$1,098	$1,259
Ninth decil	870	901	917	787	874	720	971
Eighth decil	678	742	813	720	817	686	902
Seventh decil	647	658	722	659	789	647	844
Sixth decil	627	614	663	609	749	629	818
Median average[1]	607	593	659	592	717	591	772
Fourth decil	561	578	625	546	668	538	731
Third decil	522	524	578	506	616	511	679
Second decil	485	484	516	480	569	481	620
First decil	401	433	444	414	472	357	480
Lowest average {Amount	247	258	310	297	417	307	401
Lowest average {State	N. C.	S. C.	N. C.	N. C.	S. C.	S. C.	S. C.
United States (average)	$603	$582	$640	$576	$677	$595	$839

[1] 1899, District of Columbia; 1904, Michigan; 1909, New York; 1914, Oklahoma; 1919, Connecticut; 1921, New Jersey; 1923, New Mexico.

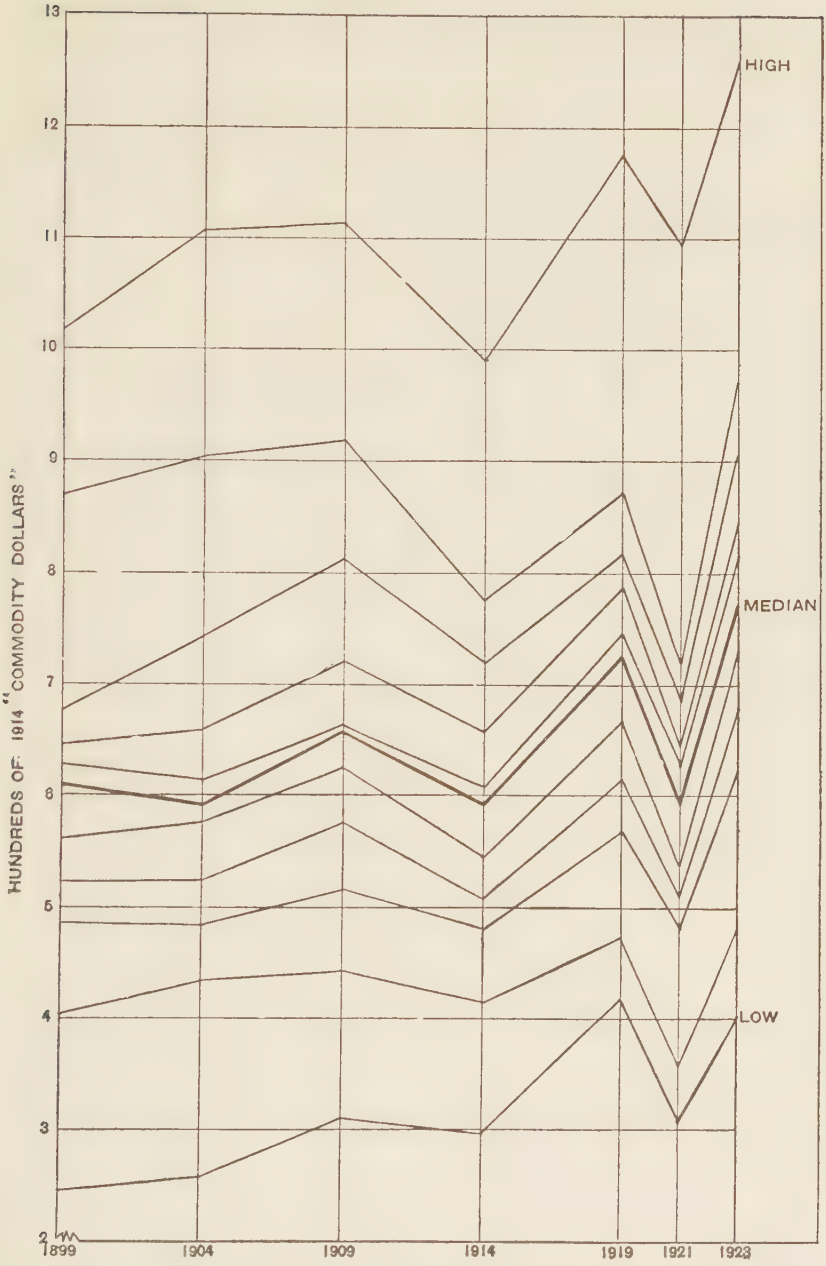


FIG. 17.—MEDIAN, DECIL, AND EXTREME STATE AVERAGES OF REAL EARNINGS, PER CAPITA, CENSUS YEARS: 1899–1923

TABLE 60.—THE 48 STATES AND THE DISTRICT OF COLUMBIA ARRANGED ACCORDING TO THE PURCHASING POWER, PER CAPITA, OF THE MONEY EARNINGS OF THEIR MANUFACTURING WAGE EARNERS. ALL INDUSTRIES COMBINED, CENSUS YEARS: 1899–1923

ANNUAL "REAL" EARNINGS PER CAPITA (IN DOLLARS OF 1914 PURCHASING POWER)	NUMBER OF STATES IN EACH EARNINGS GROUP AND PERCENTAGE BORNE BY AGGREGATE AVERAGE NUMBER OF WAGE EARNERS IN THAT GROUP OF STATES, TO THE TOTAL NUMBER OF WAGE EARNERS IN ALL MANUFACTURING INDUSTRIES							
	1899		1904		1909		1914	
	Number [1]	Per cent	Number [2]	Per cent	Number [3]	Per cent	Number [4]	Per cent
$200–$249	a 2	2.24						
$250–$299			a 2	2.65			a 1	1.94
$300–$349	b 1	1.58	b 1	1.70	a 2	2.94	b 2	2.50
$350–$399	c 1	.50			b 1	1.58	c 1	.66
$400–$449	d 4	3.82	a 4	4.43	c 4	4.08	d 4	4.24
$450–$499	c 4	4.65	d 4	4.18	d 1	1.09	a 5	4.71
$500–$549	f 6	5.82	a 8	16.14	a 4	4.64	f 7	17.26
$550–$599	a 6	17.51	f 8	42.77	f 7	14.94	a 6	36.12
$600–$649	b 11	52.67	a 7	15.83	a 5	22.56	b 6	15.32
$650–$699	a 5	7.97	b 3	8.26	b 8	27.99	c 5	8.98
$700–$749	f 1	.06	c 3	.24	c 4	16.02	f 5	4.90
$750–$799	b 2	2.35	f 1	.34	f 3	.15	b 2	2.94
$800–$849	f 1	.28	b 2	2.72	b 1	.18		
$850–$899	e 1	.47	f 1	.40	f 2	.85	f 3	.33
$900–$949	e 1	.04	e 1	.06	e 3	2.90	e 1	.13
$950–$999			a 2	.12			a 1	.05
$1,000–$1,049	a 3	.26			a 2	.14		
$1,050–$1,099			a 1	.01	a 1	.18		
$1,100–$1,149			g 1	.16	g 1	.03		
$1,150–$1,199								
$1,200–$1,249								
$1,250–$1,299								

ANNUAL "REAL" EARNINGS PER CAPITA (IN DOLLARS OF 1914 PURCHASING POWER)	NUMBER OF STATES IN EACH EARNINGS GROUP AND PERCENTAGE BORNE BY AGGREGATE AVERAGE NUMBER OF WAGE EARNERS IN THAT GROUP OF STATES, TO THE TOTAL NUMBER OF WAGE EARNERS IN ALL MANUFACTURING INDUSTRIES					
	1919		1921		1923	
	Number [5]	Per cent	Number [6]	Per cent	Number [7]	Per cent
$200–$249						
$250–$299						
$300–$349			a 4	5.08		
$350–$399			b 1	.48		
$400–$449	a 3	3.96	a 4	4.28	a 3	4.65
$450–$499	b 3	2.23	d 4	4.23	b 2	1.13
$500–$549	c 2	1.84	a 8	16.46	c 1	1.21
$550–$599	d 4	4.49	f 4	22.95	d 3	3.07
$600–$649	a 5	3.15	a 11	29.64	a 3	3.30
$650–$699	f 5	11.34	b 6	8.94	f 5	5.17
$700–$749	a 8	24.85	c 4	7.68	a 3	10.10
$750–$799	b 6	12.45	f 1	.16	b 8	6.11
$800–$849	c 7	21.11			c 7	38.27
$850–$899	f 3	9.64	b 1	.03	f 4	1.22
$900–$949	b 1	5.18			b 3	15.41
$950–$999					f 4	9.98
$1,000–$1,049					e 1	.19
$1,050–$1,099			f 1	.10		
$1,100–$1,149	f 1	.07			a 1	.05
$1,150–$1,199	e 1	.09				
$1,200–$1,249					a 1	.09
$1,250–$1,299						

(See next page for footnotes.)

[1] The States represented by the numbers in this column are:
- [a] North Carolina, South Carolina.
- [b] Georgia.
- [c] Arkansas.
- [d] Alabama, Mississippi, Tennessee, Virginia.
- [e] Florida, Kentucky, Louisiana, Maryland.
- [f] Maine, New Hampshire, Oklahoma, Rhode Island, Vermont, West Virginia.
- [g] Delaware, Iowa, Massachusetts, Michigan, Texas, Wisconsin.
- [h] Connecticut, District of Columbia, Missouri, Indiana, Kansas, Minnesota, Nebraska, New Jersey, New York, Ohio, Pennsylvania.
- [i] Illinois, New Mexico, North Dakota, Oregon, Utah.
- [j] South Dakota.
- [k] California, Washington.
- [l] Idaho.
- [m] Colorado.
- [n] Wyoming.
- [o] Montana, Nevada, Arizona.

[2] The States represented by the numbers in this column are:
- [a] North Carolina, South Carolina.
- [b] Georgia.
- [c] Alabama, Mississippi, Tennessee, Virginia.
- [d] Arkansas, Florida, Kentucky, Maryland.
- [e] Delaware, Louisiana, Maine, Massachusetts, New Hampshire, Rhode Island, Texas, Vermont.
- [f] Connecticut, Iowa, Michigan, New Jersey, New York, Oklahoma, Pennsylvania, West Virginia.
- [g] District of Columbia, Indiana, Kansas, Missouri, Nebraska, Ohio, Wisconsin.
- [h] Illinois, Minnesota, South Dakota.
- [i] New Mexico, North Dakota, Utah.
- [j] Oregon.
- [k] California, Washington.
- [l] Colorado.
- [m] Idaho.
- [n] Arizona, Wyoming.
- [o] Nevada.
- [p] Montana.

[3] The States represented by the numbers in this column are:
- [a] North Carolina, South Carolina.
- [b] Georgia.
- [c] Arkansas, Mississippi, Tennessee, Virginia.
- [d] Alabama.
- [e] Florida, Kentucky, Louisiana, Maryland.
- [f] Delaware, Maine, Massachusetts, New Hampshire, Rhode Island, Texas, Vermont.
- [g] Connecticut, New Jersey, Oklahoma, Pennsylvania, West Virginia.
- [h] District of Columbia, Indiana, Iowa, Michigan, Missouri, Nebraska, New York, Wisconsin.
- [i] Illinois, Kansas, Minnesota, Ohio.
- [j] New Mexico, North Dakota, South Dakota.
- [k] Utah.
- [l] Colorado, Oregon.
- [m] California, Idaho, Washington.
- [n] Arizona, Wyoming.
- [o] Montana.
- [p] Nevada.

[4] The States represented by the numbers in this column are:
- [a] North Carolina.
- [b] Georgia, South Carolina.
- [c] Mississippi.
- [d] Alabama, Arkansas, Tennessee, Virginia.
- [e] Delaware, Florida, Kentucky, Louisiana, Maryland.
- [f] Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Texas, Vermont.

Footnote [4]—Continued.
- [g] District of Columbia, Missouri, New Jersey, New York, Oklahoma, Pennsylvania.
- [h] Indiana, Kansas, Louisiana, Ohio, West Virginia, Wisconsin.
- [i] Illinois, Minnesota, Nebraska, New Mexico, South Dakota.
- [j] Colorado, Michigan, North Dakota, Oregon, Utah.
- [k] California, Washington.
- [l] Arizona, Montana, Wyoming.
- [m] Idaho.
- [n] Nevada.

[5] The States represented by the numbers in this column are:
- [a] Georgia, North Carolina, South Carolina.
- [b] Arkansas, Mississippi, Tennessee.
- [c] Kentucky, Louisiana.
- [d] Alabama, Florida, Texas, Virginia.
- [e] District of Columbia, New Hampshire, Rhode Island, Utah, Vermont.
- [f] Maine, Massachusetts, Missouri, New Mexico, Oklahoma.
- [g] California, Colorado, Connecticut, Iowa, Maryland, Minnesota, New York, West Virginia.
- [h] Indiana, Kansas, Montana, New Jersey, North Dakota, Wisconsin.
- [i] Delaware, Illinois, Nebraska, Nevada, Oregon, Pennsylvania, South Dakota.
- [j] Idaho, Ohio, Washington.
- [k] Michigan.
- [l] Wyoming.
- [m] Arizona.

[6] The States represented by the numbers in this column are:
- [a] Georgia, Mississippi, North Carolina, South Carolina.
- [b] Arkansas.
- [c] Alabama, Florida, Louisiana, Tennessee.
- [d] New Hampshire, Rhode Island, Virginia, Vermont.
- [e] Connecticut, Delaware, Kentucky, Maine, Massachusetts, Maryland, New Mexico, Texas.
- [f] Missouri, New Jersey, Pennsylvania, Wisconsin.
- [g] Indiana, Iowa, Kansas, Minnesota, Nebraska, New York, Ohio, Oklahoma, Oregon, Utah, West Virginia.
- [h] Arizona, District of Columbia, Illinois, Montana, South Dakota, Washington.
- [i] California, Colorado, Michigan, North Dakota.
- [j] Idaho.
- [k] Nevada.
- [l] Wyoming.

[7] The States represented by the numbers in this column are:
- [a] Georgia, North Carolina, South Carolina.
- [b] Arkansas, Mississippi.
- [c] Tennessee.
- [d] Alabama, Florida, Louisiana.
- [e] New Hampshire, Texas, Virginia.
- [f] Kentucky, Maine, Maryland, Rhode Island, Vermont.
- [g] Delaware, Massachusetts, Missouri.
- [h] Iowa, Kansas, Minnesota, Nebraska, New Mexico, South Dakota, Utah, Wisconsin.
- [i] Connecticut, Indiana, New Jersey, New York, Oklahoma, Pennsylvania, West Virginia.
- [j] Colorado, District of Columbia, North Dakota, Oregon.
- [k] Arizona, Illinois, Ohio.
- [l] California, Michigan, Montana, Washington.
- [m] Idaho.
- [n] Nevada.
- [o] Wyoming.

INDUSTRIAL DIFFERENCES IN REAL EARNINGS

More important than the two foregoing summaries of State averages in the amounts of real earnings are those which show the industry variations. Table 25 (p. 69) shows the results for each of the 41 selected industries, arranged in each census year in the order of decreasing real earnings per capita. The results show what wide differences even in average real earnings actually existed among the different industries. In 1921, for example, the per capita average amount of real earnings was estimated to be $595. This amount is shown by the figures in Table 25 to cover industries in which the corresponding industry averages range from the lowest industry average of $422 for smelting and refining, copper, lead, and zinc to the highest average of $1,006 for printing and publishing, book and job.

The more detailed frequency distributions for each census year are given in Table 61. As before, the number of industries falling within each real earnings group is given in the left-hand column under each year, and the percentage of all wage earners employed in those industries in the columns to the right. Lists to identify the separate industries in each group in the left-hand columns are given in footnotes to the table.

TABLE 61.—THE 41 SELECTED INDUSTRIES, ARRANGED ACCORDING TO THE PURCHASING POWER, PER CAPITA, OF THE MONEY EARNINGS OF THEIR MANUFACTURING WAGE EARNERS, ALL INDUSTRIES COMBINED, CENSUS YEARS: 1899–1925

ANNUAL "REAL" EARNINGS PER CAPITA (DOLLARS)	NUMBER OF INDUSTRIES IN EACH EARNINGS GROUP AND PERCENTAGE BORNE BY AGGREGATE AVERAGE NUMBER OF WAGE EARNERS IN THAT GROUP OF INDUSTRIES TO THE TOTAL NUMBER OF WAGE EARNERS IN ALL MANUFACTURING INDUSTRIES							
	*1899		1904		1909		1914	
	Number [1]	Per cent	Number [2]	Per cent	Number [3]	Per cent	Number [4]	Per cent
$400–$424	[a] 1	2.67						
$425–$449								
$450–$474	[b] 1	8.77	[a] 3	9.08			[a] 1	6.82
$475–$499	[c] 3	9.38	[b] 1	1.90	[a] 2	11.15	[b] 2	7.85
$500–$524			[a] 5	12.61	[b] 2	5.93	[a] 2	1.90
$525–$549	[d] 2	2.43	[d] 1	1.05	[c] 1	1.95	[d] 6	6.87
$550–$574	[a] 3	2.07	[a] 5	4.77	[d] 2	5.07	[a] 3	2.59
$575–$599	[f] 5	5.69	[f] 3	1.38	[d] 3	2.51	[f] 3	3.19
$600–$624	[a] 5	4.42	[a] 6	7.57	[f] 4	3.35	[a] 6	7.02
$625–$649	[b] 3	3.46	[b] 2	2.15	[a] 2	1.17	[b] 3	6.05
$650–$674	[g] 2	2.84	[g] 2	5.82	[b] 5	4.25	[g] 5	11.30
$675–$699	[f] 2	.57	[f] 3	5.67	[g] 3	5.00	[f] 2	3.14
$700–$724	[b] 1	3.68	[b] 3	3.44	[f] 4	3.86		
$725–$749	[h] 2	4.79	[h] 3	13.41	[b] 3	5.65	[b] 2	3.60
$750–$774	[m] 2	6.45	[m] 1	1.60	[h] 2	.79	[h] 2	2.76
$775–$799	[n] 3	10.88	[n] 1	1.77	[m] 1	3.00	[m] 3	4.12
$800–$824	[a] 2	.99	[a] 1	.88	[n] 4	15.38	[n] 1	1.06
$825–$849			[p] 1	1.17	[a] 2	3.96		
$850–$874	[p] 1	1.12			[p] 1	1.64		
$875–$899	[q] 1	.26						
$900–$924								
$925–$949								
$950–$974								
$975–$999								
$1,000–$1,024								

* Only 39 industries reported for 1899. Data for "Automobiles, bodies and parts" and "Chemicals" being unavailable.

(See pages 136 and 137 for footnotes.)

TABLE 61.—THE 41 SELECTED INDUSTRIES, ARRANGED ACCORDING TO THE PURCHASING POWER, PER CAPITA, OF THE MONEY EARNINGS OF THEIR MANUFACTURING WAGE EARNERS, ALL INDUSTRIES COMBINED, CENSUS YEARS: 1899–1925—Continued

ANNUAL "REAL" EARNINGS PER CAPITA (DOLLARS)	NUMBER OF INDUSTRIES IN EACH EARNINGS GROUP AND PERCENTAGE BORNE BY AGGREGATE AVERAGE NUMBER OF WAGE EARNERS IN THAT GROUP OF INDUSTRIES TO THE TOTAL NUMBER OF WAGE EARNERS IN ALL MANUFACTURING INDUSTRIES							
	1899		1904		1909		1914	
	Number [1]	Per cent	Number [2]	Per cent	Number [3]	Per cent	Number [4]	Per cent
$1,025–$1,049								
$1,050–$1,074								
$1,075–$1,099								
$1,100–$1,124								
$1,125–$1,149								
$1,150–$1,174								
$1,175–$1,199								
$1,200–$1,224								
$1,225–$1,249								
Total	39	70.47	41	74.27	41	74.66	41	68.27
Not covered in this report		29.53		25.73		25.34		31.73
Total wage earners, all manufacturing industries	4,712,763		5,468,383		6,615,046		7,036,247	

ANNUAL "REAL" EARNINGS PER CAPITA (DOLLARS)	NUMBER OF INDUSTRIES IN EACH EARNINGS GROUP AND PERCENTAGE BORNE BY AGGREGATE AVERAGE NUMBER OF WAGE EARNERS IN THAT GROUP OF INDUSTRIES TO THE TOTAL NUMBER OF WAGE EARNERS IN ALL MANUFACTURING INDUSTRIES							
	1919		1921		1923		† 1925	
	Number [5]	Per cent	Number [6]	Per cent	Number [7]	Per cent	Number [8]	Per cent
$400–$424			[a] 1	0.27				
$425–$449			[b] 1	5.24				
$450–$474								
$475–$499	[a] 1	0.19	[c] 3	1.86				
$500–$524	[b] 1	1.53	[d] 2	4.24				
$525–$549	[c] 2	3.73						
$550–$574	[d] 3	8.06	[e] 4	9.98	[a] 1	1.48		
$575–$599	[e] 3	6.03	[f] 6	9.91			[a] 2	6.99
$600–$624	[f] 4	3.43	[g] 2	1.16				
$625–$649	[g] 1	1.56	[h] 3	6.36	[b] 3	11.69	[b] 3	1.60
$650–$674	[h] 5	4.33	[i] 4	8.47	[c] 1	.21	[c] 2	7.62
$675–$699	[i] 3	1.52					[d] 2	2.62
$700–$724	[j] 5	9.34	[j] 4	5.88	[d] 1	2.21	[e] 2	1.18
$725–$749	[k] 1	1.32	[k] 2	1.95	[e] 4	4.06	[f] 3	3.89
$750–$774	[l] 1	2.32	[l] 5	6.42	[f] 4	5.37	[g] 1	1.91
$775–$799	[m] 3	7.53			[g] 1	.72		
$800–$824	[n] 2	5.96			[h] 3	3.58	[h] 2	3.13
$825–$849	[o] 2	3.10					[i] 2	2.92
$850–$874					[i] 2	2.89	[j] 1	.76
$875–$899	[p] 1	1.82			[j] 5	6.41	[k] 5	10.24
$900–$924	[q] 1	1.93			[k] 1	.13	[l] 1	1.58
$925–$949			[m] 1	2.09	[l] 3	9.74	[m] 1	.35
$950–$974	[r] 1	4.12	[n] 1	2.38	[m] 2	2.68	[n] 4	5.02
$975–$999	[s] 1	.46	[o] 1	1.55	[n] 3	2.80	[o] 1	2.36
$1,000–$1,024			[p] 1	1.74			[p] 3	11.32
$1,025–$1,049					[o] 2	5.53		
$1,050–$1,074							[q] 2	2.89
$1,075–$1,099					[p] 2	6.64		
$1,100–$1,124								
$1,125–$1,149					[q] 1	1.52		
$1,150–$1,174								
$1,175–$1,199					[r] 2	2.81		
$1,200–$1,224							[r] 1	1.59
$1,225–$1,249							[s] 1	1.40
Total	41	68.28	41	69.50	41	70.47	39	69.37
Not covered in this report		31.72		30.50		29.53		30.63
Total wage earners, all manufacturing industries	9,096,372		6,946,570		8,778,173		8,384,261	

† Only 39 industries reported for 1925. Data for "Mineral and soda waters" and "Liquors, malt," being unavailable.

(See pages 136 and 137 for footnotes.)

[1] The industries represented by the figures in this column are:
- [a] Woolen and worsted goods.
- [b] Lumber and timber products.
- [c] Brick and tile, pottery, terra-cotta, and fire-clay products; Cars, steam-railroad, not including operations of railroad companies; Cotton manufactures.
- [d] Knit goods; Shipbuilding, steel.
- [e] Agricultural implements; Electrical machinery, apparatus, and supplies; Mineral and soda waters.
- [f] Bread and other bakery products; Flour-mill and gristmill products; Leather, tanned, curried, and finished; Rubber tires, tubes, and rubber goods, not elsewhere specified; Tobacco, cigars and cigarettes.
- [g] Carpets and rugs, other than rag; Confectionery; Dyeing and finishing textiles, exclusive of that done in textile mills; Lumber, planing-mill products, not including planing mills connected with sawmills; Paper and wood pulp.
- [h] Furniture; Iron and steel, blast furnaces; Shirts.
- [i] Silk goods, including throwsters; Slaughtering and meat packing.
- [j] Automobiles; Smelting and refining, copper, lead, and zinc.
- [k] Cars and general shop construction and repairs by steam-railroad companies.
- [l] Boots and shoes, not including rubber boots and shoes; Clothing, women's.
- [m] Clothing, men's; Iron and steel, steel works and rolling mills.
- [n] Foundry and machine-shop products; Printing and publishing, book and job; Printing and publishing, newspapers and periodicals
- [o] Cars and general shop construction and repairs by electric-railroad companies; Liquors, malt.
- [p] Glass.
- [q] Petroleum, refining.

[2] The industries represented by the figures in this column are:
- [a] Cars, steam-railroad, not including operations of railroad companies; Woolen and worsted goods.
- [b] Knit goods.
- [c] Agricultural implements; Automobiles, bodies and parts; Electrical machinery, apparatus, and supplies; Lumber and timber products; Shipbuilding, steel.
- [d] Leather, tanned, curried, and finished.
- [e] Carpets and rugs, other than rag; Dyeing and finishing textiles, exclusive of that done in textile mills; Mineral and soda waters; Rubber tires, tubes, and rubber goods, not elsewhere specified; Tobacco, cigars and cigarettes.
- [f] Confectionery; Flour-mill and gristmill products; Shirts.
- [g] Automobiles; Brick and tile, pottery, terra-cotta and fire-clay products; Furniture; Iron and steel, blast furnaces; Paper and wood pulp; Silk goods, including throwsters.
- [h] Chemicals; Lumber, planing-mill products, not including planing mills connected with sawmills.
- [i] Bread and other bakery products; Cars and general shop construction and repair by steam-railroad companies.
- [j] Iron and steel, steel works and rolling mills; Slaughtering and meat packing; Smelting and refining, copper, lead, and zinc.
- [k] Boots and shoes, not including rubber boots and shoes; Petroleum refining; Cars and general shop construction and repairs by electric-railroad companies.
- [l] Clothing, men's; Clothing, women's; Foundry and machine-shop products.
- [m] Printing and publishing, book and job.
- [n] Printing and publishing, newspapers and periodicals.
- [o] Liquors, malt.
- [p] Glass.

[3] The industries represented by figures in this column are:
- [a] Cars, steam-railroad, not including operations of railroad companies; Lumber and timber products.
- [b] Cotton manufactures; Mineral and soda waters.
- [c] Knit goods.
- [d] Tobacco, cigars and cigarettes; Woolen and worsted goods.
- [e] Agricultural implements; Electrical machinery, apparatus, and supplies; Shipbuilding, steel.
- [f] Automobiles, bodies and parts; Dyeing and finishing textiles, exclusive of that done in textile mills; Flour-mill and gristmill products; Leather, tanned, curried, and finished.
- [g] Carpets and rugs, other than rag; Confectionery.
- [h] Automobiles; Brick and tile, pottery, terra-cotta and fire-clay products; Chemicals; Paper and wood pulp; Shirts.
- [i] Furniture; Lumber, planing-mill products, not including planing mills connected with sawmills; Slaughtering and meat packing.
- [j] Bread and other bakery products; Rubber tires, tubes, and rubber goods, not elsewhere specified; Silk goods, including throwsters; Smelting and refining, copper, lead, and zinc.
- [k] Glass; Cars and general shop construction and repairs by electric-railroad companies; Cars and general shop construction and repairs by steam-railroad companies.
- [l] Iron and steel, blast furnaces; Petroleum refining.
- [m] Boots and shoes, not including rubber boots and shoes.
- [n] Clothing, men's; Foundry and machine-shop products; Iron and steel, steel works and rolling mills; Liquors, malt.
- [o] Clothing, women's; Printing and publishing, book and job.
- [p] Printing and publishing, newspapers and periodicals.

The industries represented by figures in this column are:
- [a] Lumber and timber products.
- [b] Cotton manufactures; Woolen and worsted goods.
- [c] Electrical machinery, apparatus, and supplies; Mineral and soda waters.
- [d] Carpets and rugs, other than rag; Cars, steam-railroad, not including operations of railroad companies; Flour-mill and gristmill products; Leather, tanned, curried, and finished; Knit goods; Tobacco, cigars and cigarettes.
- [e] Brick and tile, pottery, terra-cotta and fire-clay products; Dyeing and finishing textiles, exclusive of that done in textile mills; Shipbuilding, steel.
- [f] Agricultural implements; Bread and other bakery products; Shirts.
- [g] Automobiles, bodies and parts; Furniture; Lumber, planing-mill products, not including planing mills connected with sawmills; Smelting and refining, copper, lead, and zinc; Paper and wood pulp; Slaughtering and meat packing.
- [h] Cars and general shop construction and repairs by steam-railroad companies; Chemicals; Confectionery.
- [i] Cars and general shop construction and repairs by electric-railroad companies; Foundry and machine-shop products; Iron and steel, steel works and rolling mills; Rubber tires, tubes, and rubber goods, not elsewhere specified; Silk goods, including throwsters.
- [j] Boots and shoes, not including rubber boots and shoes; Iron and steel, blast furnaces.
- [k] Automobiles; Clothing, men's.
- [l] Clothing, women's; Petroleum refining.
- [m] Liquors, malt; Printing and publishing, book and job; Printing and publishing, newspapers and periodicals.
- [n] Glass.

[a] The industries represented by figures in this column are:
- [a] Mineral and soda waters.
- [b] Tobacco, cigars and cigarettes.
- [c] Knit goods; Woolen and worsted goods.
- [d] Electrical machinery, apparatus, and supplies; Lumber and timber products; Shirts.
- [e] Cotton manufactures; Flour-mill and gristmill products; Dyeing and finishing textiles, exclusive of that done in textile mills.
- [f] Agricultural implements; Automobiles, bodies and parts; Lumber, planing-mill products, not including planing mills connected with sawmills; Smelting and refining, copper, lead, and zinc.
- [g] Bread and other bakery products.
- [h] Brick and tile, pottery, terra-cotta, and fire-clay products; Carpets and rugs, other than rag; Cars, steam-railroad, not including operations of railroad companies; Confectionery; Furniture.
- [i] Leather, tanned, curried, and finished; Liquors, malt; Cars and general shop construction and repairs by electric-railroad companies.
- [j] Automobiles; Chemicals; Paper and wood pulp; Shipbuilding, steel; Silk goods, including throwsters.
- [k] Printing and publishing, newspapers and periodicals.
- [l] Boots and shoes, not including rubber boots and shoes.
- [m] Glass; Printing and publishing, book and job; Cars and general shop construction and repairs by steam-railroad companies.
- [n] Foundry and machine-shop products; Petroleum refining.
- [o] Rubber tires, tubes, and rubber goods, not elsewhere specified; Slaughtering and meat packing.
- [p] Clothing, women's.
- [q] Clothing, men's.
- [r] Iron and steel, steel works and rolling mills.
- [s] Iron and steel, blast furnaces.

[b] The industries represented by the figures in this column are:
- [a] Smelting and refining, copper, lead, and zinc.
- [b] Lumber and timber products.
- [c] Automobiles, bodies and parts; Cars, steam-railroad, not including operation of railroad companies; Mineral and soda waters.
- [d] Electrical machinery, apparatus, and supplies; Tobacco, cigars and cigarettes.
- [e] Automobiles; Agricultural implements; Cotton manufactures; Shipbuilding, steel.
- [f] Cars and general shop construction and repairs by electric-railroad companies; Chemicals; Iron and steel, steel works and rolling mills; Leather, tanned, curried, and finished; Knit goods; Woolen and worsted goods.
- [g] Flour-mill and gristmill products; Shirts.
- [h] Brick and tile, pottery, terra-cotta and fire-clay products; Dyeing and finishing textiles, exclusive of that done in textile mills; Foundry and machine-shop products.
- [i] Cars and general shop construction and repairs by steam-railroad companies; Iron and steel, blast furnaces; Lumber, planing-mill products, not including planing mills connected with sawmills; Paper and wood pulp.
- [j] Bread and other bakery products; Confectionery; Furniture; Rubber tires, tubes, and rubber goods not elsewhere specified.
- [k] Liquors, malt; Slaughtering and meat packing.
- [l] Boots and shoes, not including rubber boots and shoes; Carpets and rugs, other than rag; Glass; Petroleum refining; Silk goods, including throwsters.
- [m] Clothing, women's.
- [n] Clothing, men's.
- [o] Printing and publishing, newspapers and periodicals.
- [p] Printing and publishing, book and job.

[c] The industries represented by the figures in this column are:
- [a] Tobacco, cigars and cigarettes.
- [b] Cotton manufactures; Flour-mill and gristmill products; Lumber and timber products.
- [c] Mineral and soda waters.
- [d] Knit goods.
- [e] Agricultural implements; Electrical machinery, apparatus, and supplies; Shirts; Smelting and refining, copper, lead, and zinc.
- [f] Bread and other bakery products; Dyeing and finishing textiles, exclusive of that done in textile mills; Shipbuilding, steel; Woolen and worsted goods.
- [g] Confectionery.
- [h] Automobiles, bodies and parts; Cars, steam-railroad not including operations of railroad companies; Chemicals.
- [i] Paper and wood pulp; Slaughtering and meat packing.
- [j] Boots and shoes, not including rubber boots and shoes; Brick and tile, pottery, terra-cotta and fire-clay products; Cars and general shop construction and repairs by electric-railroad companies; Leather, tanned, curried, and finished; Lumber, planing-mill products, not including planing mills connected with sawmills.
- [k] Liquors, malt.
- [l] Automobiles; Cars and general shop construction and repairs by steam-railroad companies; Silk goods including throwsters.
- [m] Furniture; Petroleum refining.
- [n] Carpets and rugs, other than rag; Glass; Rubber tires, tubes, and rubber goods not elsewhere specified.
- [o] Foundry and machine shop products; Iron and steel, blast furnaces.
- [p] Clothing, men's; Iron and steel, steel works and rolling mills.
- [q] Clothing, women's.
- [r] Printing and publishing, book and job; Printing and publishing newspapers and periodicals.

[d] The industries represented by the figures in this column are:
- [a] Cotton manufactures; Tobacco, cigars and cigarettes.
- [b] Flour-mill and gristmill products; Leather, tanned, curried, and finished; Shirts.
- [c] Lumber and timber products; Woolen and worsted goods.
- [d] Knit goods; Smelting and refining, copper, lead, and zinc.
- [e] Agricultural implements; Dyeing and finishing textiles, exclusive of that done in textile mills.
- [f] Cars, steam-railroad, not including operations of railroad companies; Electrical machinery, apparatus, and supplies; Shipbuilding, steel.
- [g] Bread and other bakery products.
- [h] Boots and shoes, not including rubber boots and shoes; Chemicals.
- [i] Paper and wood pulp; Slaughtering and meat packing.
- [j] Confectionery.
- [k] Automobiles, bodies and parts; Brick and tile, pottery, terra-cotta and fire-clay products; Carpets and rugs, other than rag; Cars and general shop construction and repairs by electric-railroad companies; Cars and general shop construction and repairs by steam-railroad companies.
- [l] Silk goods, including throwsters.
- [m] Iron and steel, blast furnaces.
- [n] Clothing, men's; Glass; Lumber, planing-mill products, not including planing mills connected with sawmills; Petroleum refining.
- [o] Automobiles.
- [p] Foundry and machine-shop products; Furniture; Iron and steel, steel works and rolling mills.
- [q] Clothing, women's; Rubber tires, tubes, and rubber goods not elsewhere specified.
- [r] Printing and publishing, book and job.
- [s] Printing and publishing, newspapers and periodicals.

Taking any one census year by itself, there does not appear to be a very great degree of concentration; there is more scatter in evidence as between industries than as between States—not much more, however. What concentration exists is brought out more definitely in the summary of all of the industry averages which is given in Table 62. Alongside of the summary of industry averages is placed a corresponding summary of the 343 State averages from Table 60. Both distributions show, in the form of quite pronounced modes, that the largest number of industry averages fall in the earnings class $600 to $650, and the largest number of State averages fall in the same class. There is evidently a very definite concentration between $600 and $650—dollars, be it remembered, of the purchasing power of money in 1914.

TABLE 62.—DISTRIBUTION OF 324 INDUSTRY AVERAGES AND 343 STATE AVERAGES OF REAL EARNINGS, PER CAPITA, ALL INDUSTRIES COMBINED: 1899–1925

"REAL" EARNINGS PER CAPITA (1914=100)	Industry averages (based on 41 selected industries)	State averages (48 States and District of Columbia)	"REAL" EARNINGS PER CAPITA (1914=100)	Industry averages (based on 41 selected industries)	State averages (48 States and District of Columbia)
Total cases	324	343	$700–$749	40	28
			$750–$799	30	23
$200–$249		2	$800–$849	22	18
$250–$299		3	$850–$899	17	15
$300–$349		10	$900–$949	8	10
$350–$399		4	$950–$999	14	7
$400–$449	3	26			
			$1,000–$1,049	6	6
$450–$499	17	23	$1,050–$1,099	4	3
$500–$549	24	36	$1,100–$1,149	1	4
$550–$599	46	38	$1,150–$1,199	2	1
$600–$649	47	48	$1,200–$1,249	2	1
$650–$699	41	37	$1,250–$1,299		

REAL EARNINGS IN THE SEVERAL STATES

The remaining tables of this chapter present the results relating to real per capita earnings in a somewhat more detailed fashion, on the basis of regional and industrial divisions. Table 68 presents a classification of amounts of per capita earnings, for all industries combined, by geographic regions and divisions, and by States. This table shows no less emphatically than did the analogous one in the preceding chapter, the vast difference in the amounts of earnings between the three grand divisions of the country. Even in their present form of absolute amounts, the figures reveal some important differences in respect to the trend of earnings. This feature of the problem, however, can be discussed more appropriately at a later point where index numbers are available. The figures of Table 68 for the three grand divisions are plotted in Figure 18. The figures for each of the 48 States and the District of Columbia are put in

graphic form in Figures 19 and 20. The results here seem, at first blush, to reflect a greater degree of uniformity in earnings than in the State figures given in Table 42 in the preceding chapter. This, however, is an illusion caused by the wide fluctuation in the purchasing power of money. An examination of the figures for the different States in any one census year will show quite as large differences

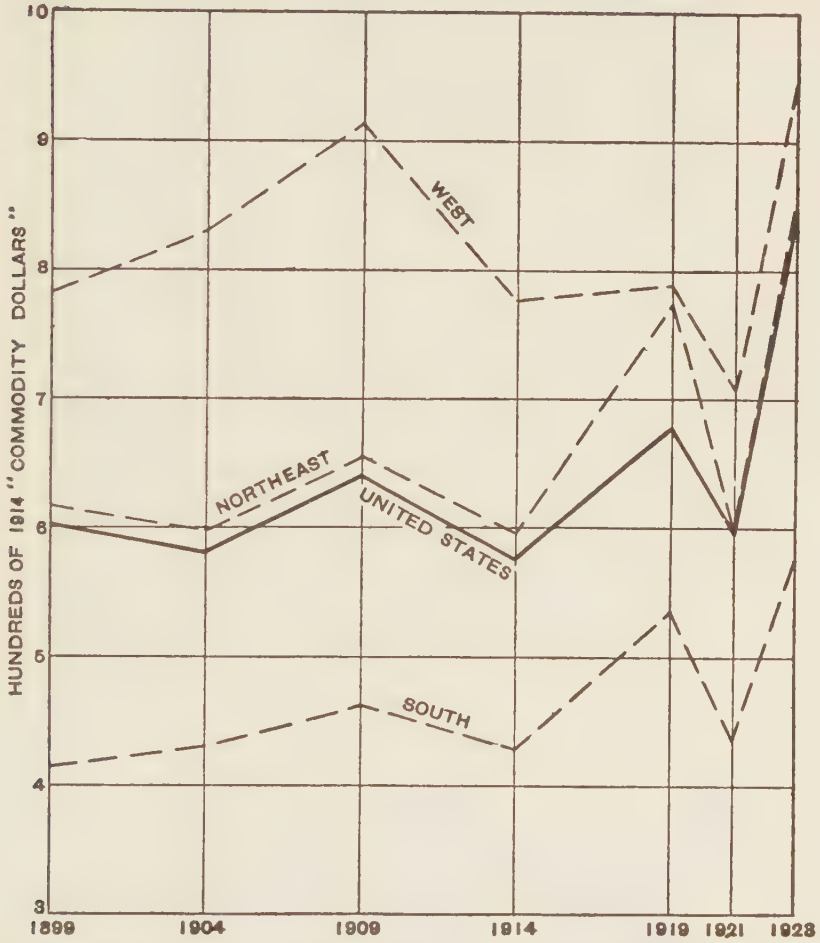


FIG. 18.—REAL INCOMES, PER CAPITA, BY GEOGRAPHIC REGIONS, CENSUS YEARS: 1899–1923

between States as in the earlier Table 42. Comparisons between different census years naturally show amounts of earnings more nearly the same, as would be expected after deflation. After deflation it appears very definitely that the natural earnings of labor in 1919 were not three times as great as were those natural earnings in 1899, as would seem to be indicated by figures given in Table 42,

which showed for the United States as a whole that money earnings were $446 in 1899 and $1,317 in 1923. When these two sums are both deflated it is found that the 1923 figure is scarcely more than

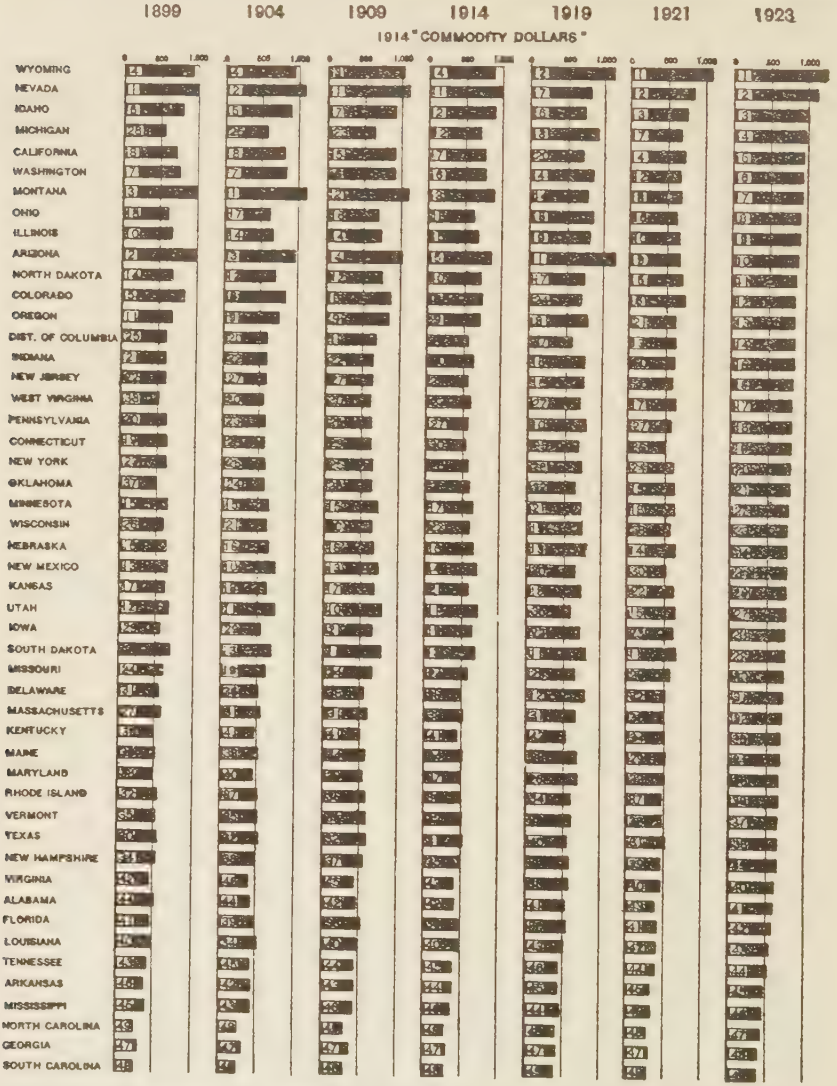


FIG. 19.—AMOUNTS OF REAL INCOME, PER CAPITA, BY STATES, CENSUS YEARS: 1899–1923

one-third again as large as the 1899 figure, the two sums being, respectively, $603 and $839.

The estimates in Table 68 of average annual real earnings for the census years 1899, 1914, and 1923 are transposed in Table 71 to the 1923 base and used in this form in construction of the three maps in

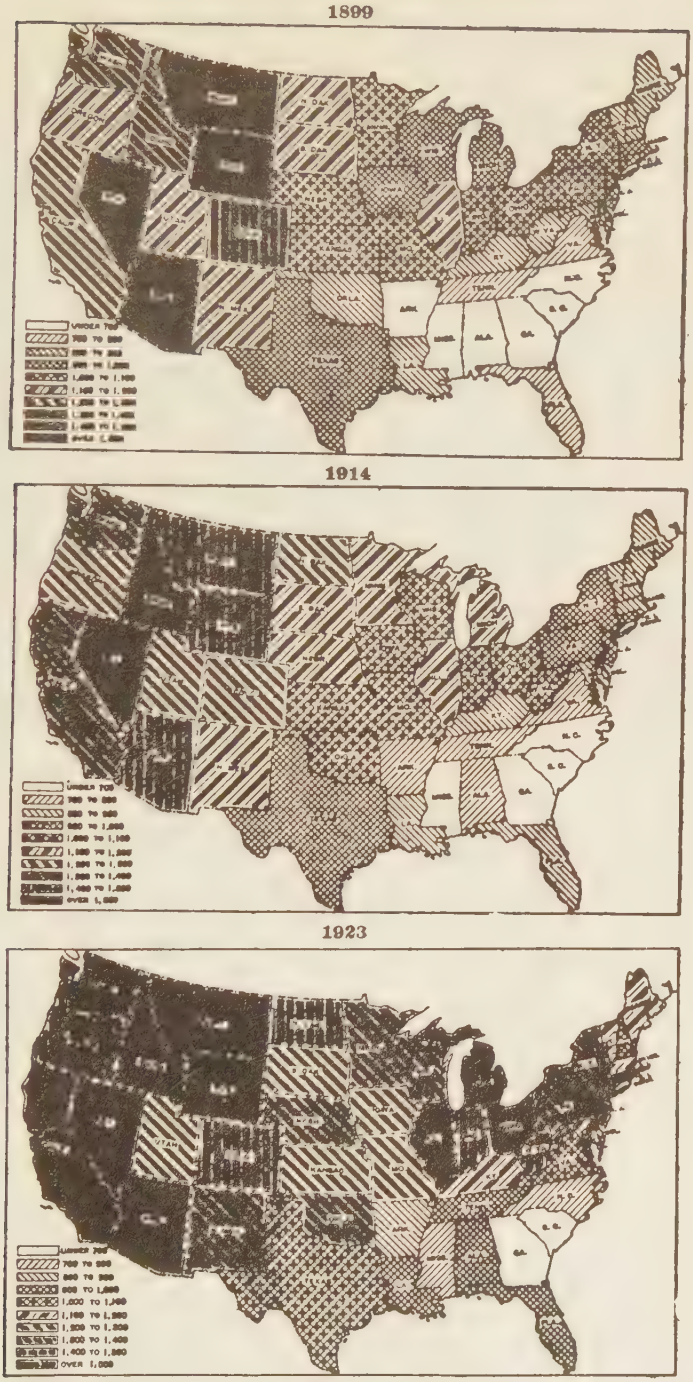


FIG. 20.—PURCHASING POWER, AT PRICE LEVEL OF 1923, OF MANUFACTURING LABOR INCOMES, PER CAPITA: 1899, 1914, AND 1923

Figure 20.[1] At each of these three censuses the West, especially the Rocky Mountain section, appears as the region of highest earnings; the South is, strikingly, an area of low earnings; the Northeast occupies an intermediate position. All three regions reflect lowest earnings in 1914, highest in 1923. The only State which maintained

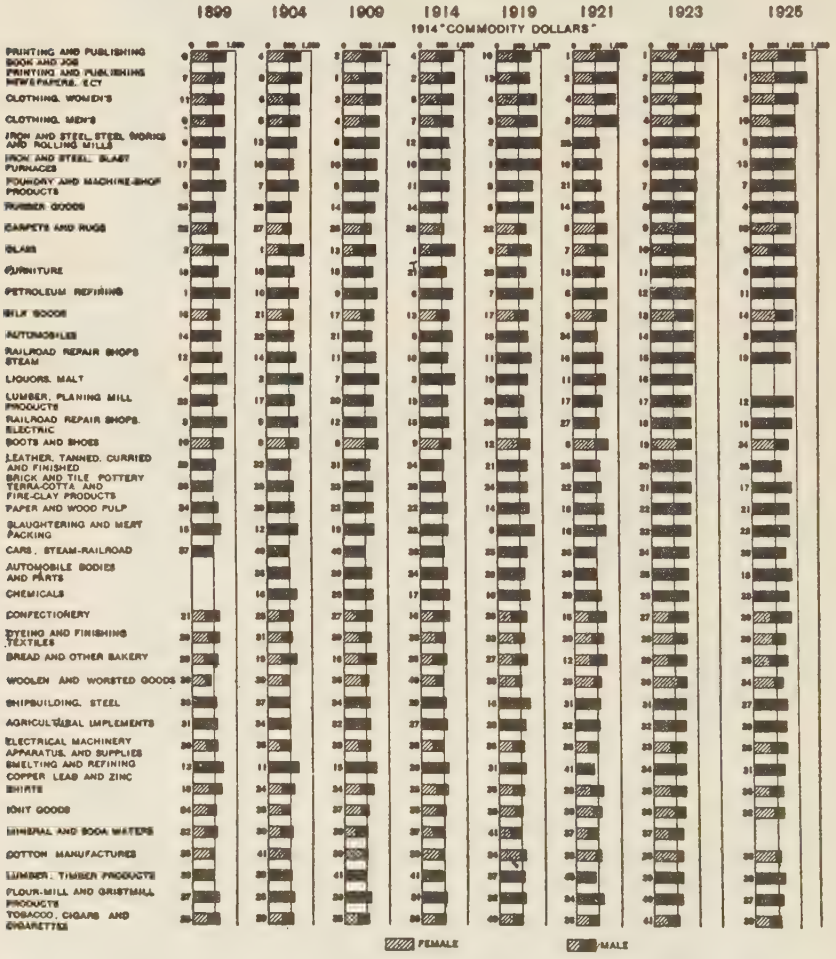


FIG. 21.—REAL INCOME, PER CAPITA, BY INDUSTRY AND BY SEX: 1899–1925

its position in the highest earnings bracket in each of the three years was Nevada, an unimportant State as a manufacturing center. South Carolina and Georgia, at the other end of the scale, are the only States which consistently remained in the lowest-earnings bracket in each of the three years.

[1] The map for 1923 appears as frontispiece and indicates State averages of money earnings in that year.

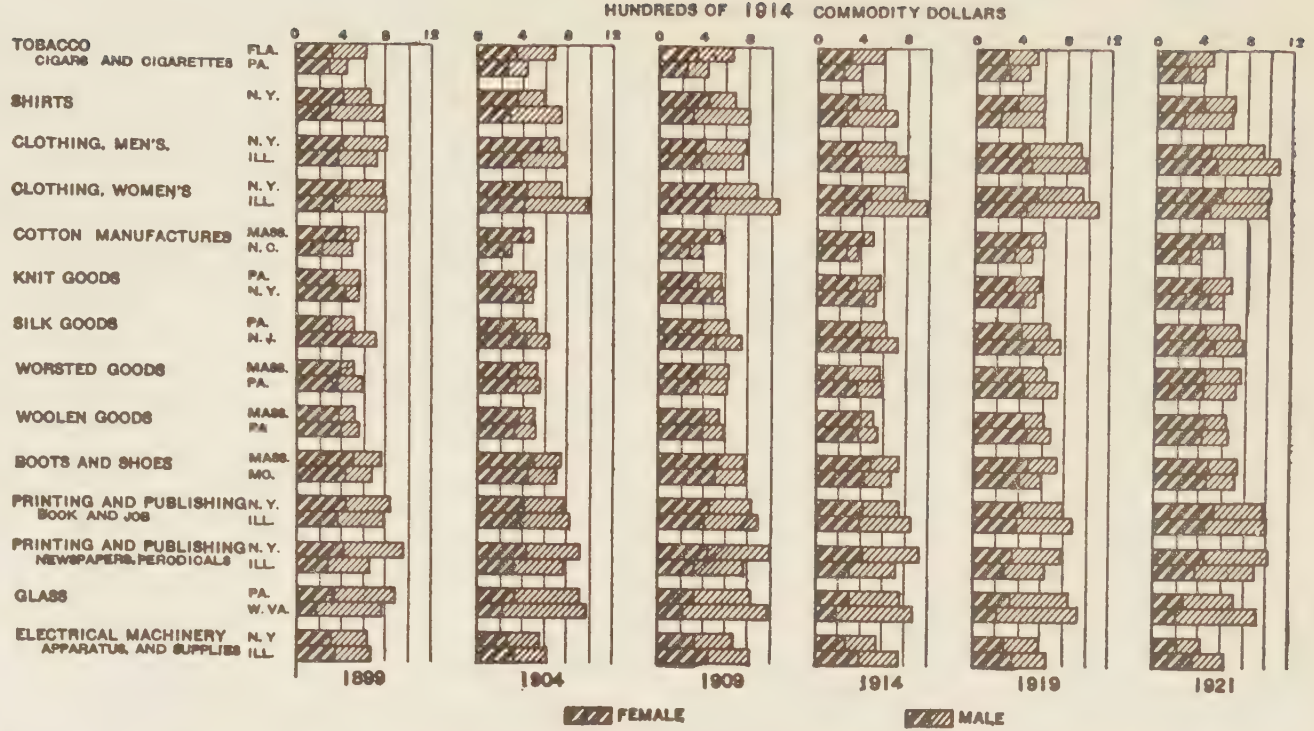


FIG. 22.—REAL INCOME, PER CAPITA, OF MALE AND FEMALE WAGE EARNERS IN TWO LEADING STATES IN EACH OF 14 SELECTED INDUSTRIES, CENSUS YEARS: 1899–1923

ANNUAL FLUCTUATIONS IN REAL EARNINGS

Up to this point most of the data presented in this chapter have referred to census years only. In Table 63 it has been possible to show the per capita amounts of real earnings for each year from 1899 to 1927 in each of 12 of our 41 selected industries.[2] It is evident from the results for the interpolated years in this table that in all or most of these industries the interpolated years reflect economic

TABLE 63.—PURCHASING POWER (AT 1914 PRICES) OF MANUFACTURING LABOR INCOMES, PER CAPITA, IN THE UNITED STATES, FOR ALL INDUSTRIES COMBINED AND FOR EACH OF 12 SELECTED INDUSTRIES, EACH YEAR: MALE WAGE EARNERS, 1899–1927

YEAR	All industries [1]	Woolen goods	Cotton manufactures	Silk goods	Knit goods	Clothing, men's	Boots and shoes	Automobiles	Iron and steel, steel works	Cars, steam railroad	Paper and wood pulp	Tobacco, cigars, and cigarettes	Leather, tanned
1899	$603	$414	$495	$658	$528	$750	$742	$688	$770	$493	$604	$596	$577
1900	591	414	516	596	516	743	712	676	795	529	612	597	584
1901	604	506	505	577	500	733	727	688	599	538	601	577	564
1902	621	501	518	645	495	745	748	709	641	580	615	595	548
1903	593	460	506	632	476	704	712	677	604	535	580	561	539
1904	582	472	458	607	483	730	719	600	675	469	608	564	546
1905	646	543	455	653	714	757	759	666	796	563	620	560	546
1906	660	610	493	645	503	764	771	680	771	507	640	543	648
1907	636	603	531	665	481	736	768	714	788	491	622	530	602
1908	570	532	546	661	423	747	798	723	631	456	589	560	603
1909	640	551	517	702	549	823	782	670	816	494	670	551	600
1910	608	523	489	663	536	872	747	723	795	421	640	532	571
1911	562	504	469	653	528	906	724	651	793	516	626	524	560
1912	617	519	506	656	543	873	720	625	814	582	631	529	549
1913	623	474	522	679	531	868	703	666	782	569	618	529	543
1914	576	477	497	663	532	743	695	737	673	535	615	529	532
1915	620	497	491	691	550	774	701	[2] 662	727	426	612	491	549
1916	718	729	547	825	656	918	787	[2] 636	994	442	685	572	658
1917	667	620	551	769	602	926	821	748	958	526	618	602	589
1918	703	627	641	783	624	957	874	608	975	503	637	541	623
1919	677	533	583	706	526	907	750	714	965	660	717	507	683
1920	726	548	618	711	541	965	712	789	1,067	761	859	588	592
1921	595	599	559	753	578	956	769	556	584	494	661	510	592
1922	705	646	576	753	623	1,022	855	800	752	572	792	542	707
1923	839	758	645	946	712	1,099	894	943	1,085	821	865	560	893
1924	776	662	614	786	622	999	776	1,015	949	609	846	495	708
1925	825	656	597	918	676	964	806	984	1,024	739	832	575	649
1926	830	646	587	906	692	924	787	935	1,022	736	834	578	645
1927	805	660	613	924	723	930	795	936	1,016	761	835	578	645

[1] Includes the 12 industries listed and 321 other manufacturing industries reported by the census.
[2] Derived from Massachusetts data on automobiles.

variations which one could not possibly estimate on the basis of known earnings amounts for the census years. Nor is it much easier, for that matter, to estimate *changes* from year to year on the basis of known quinquennial changes derived from census records. This subject will be discussed more fully in a later chapter.

The amounts of real earnings per capita for each one of the 41 selected industries are given in Table 69. The table shows, as before,

[2] The data of this table are shown in graphic form in fig. 6, pp. 58 and 59.

the deflated amounts, based on the 1914 price level, for each census year since 1899. The only feature of this table which it seems necessary to discuss is the relationship between per capita earnings of male and female wage earners. The figures, it should be noted, are in no case for both sexes combined. Where no women employees are shown, the figures are for male employees only, and in these cases the industries almost without exception employed only an inappreciable proportion of women. Where a considerable proportion of women are employed, separate per capita earnings have been calculated, and they are shown in another table for 18 of the industries. As has been remarked already in connection with a similar classification of money earnings, there is in addition to the wide difference between the earnings of men and the earnings of women, a large variation in the extent of these differences as between the various industries. The margins between the amounts shown, in respect to time, character of industry, or sex are all somewhat more clearly revealed in Figure 21 which is based upon Table 69 and in which the industries are ranked, in each census year, in the order of decreasing real earnings in 1923. There is evident a great deal of shift of position among the different industries from one census year to another, but in spite of this shifting it is roughly true that the industries in which wage earners got relatively high amounts of earnings in 1899 were the industries in which they got high amounts of earnings in 1921 and, per contra, the low-earnings industries of 1899 in general have proved to be the industries low in earnings in 1923.

Since geographic differences are so important it does not seem quite sufficient to show merely variations between regions for all industries and variations for all industries between regions. In each of these types of classification there are concealed differences which it is desirable to reveal. When we consolidate all of the manufacturing industries for the comparison of earnings in different localities, we are left in the dark as to whether for the individual industries, or some of them, the earnings are the same or much the same regardless of locality. When we consolidate geographic regions and classify the different industries separately, we find ourselves in a similar difficulty. For example, earnings for manufacturing industries generally are distinctly higher, as has been shown in preceding tables, in Pennsylvania than in Florida; yet in the tobacco industry it appears that per capita earnings have been for each census year in our quarter-century period higher in Florida than in Pennsylvania. To bring out such situations as this separate figures have been computed for two of the leading States for each of 24 of our 41 selected industries, as explained in the preceding chapter, and the results in the form of real earnings are presented in Table 70. In the case of 14 of the 24 industries, it has been possible to compute separately

for each of the two leading States the per capita earnings of male and female employees. The data of Table 70, which shows earnings separately for each sex, are put into graphic form in Figure 22. In this chart one naturally follows up the difference, just adverted to, between the earnings of wage earners in the tobacco industries and workers in the same industry in Pennsylvania. The results already given indicate that earnings have all along been higher in Florida than in Pennsylvania. Is this difference present in the case of both male and female workers? The data of Table 70 indicate that it is largely true of both sexes, but that the difference in favor of Florida is less pronounced in the case of women than in the case of men, and that in the year 1919 the per capita earnings of women in the industry were somewhat higher in Pennsylvania than in Florida, being $285 in the former, as compared with $277 in the latter State. Such cases as this are important as throwing light upon the parallelism which we have taken for granted in the changes which have taken place in the earnings of men as compared with women. Figures for the tobacco industry in Table 70 justify some concern as to the validity of such a theory, although it is not believed that they entirely controvert it. It will be seen from the general run of the figures in the same table that in the majority of the census years the earnings of women remain in a fairly constant position in relation to the earnings of men. This point can be given fuller and more intelligent treatment in connection with the earnings data after they are thrown into the form of relatives; any discussion of this point, therefore, may well be deferred.

The remaining four tables in this chapter correspond in arrangement to the four tables at the end of the preceding chapter, which present statistics on hourly earnings. In the preceding chapter these earnings were nominal hourly earnings. Here they have been deflated and are shown on the basis of uniform purchasing power, with 1914 as the standard.

The figures summarized for all industries and all regions, by sex and age groups are presented in Table 64 and for geographic regions in Table 65. The first of the two tables again reflects the difference between men, women and children that were first shown in the preceding chapter. They also show how greatly money rates are reduced by the process of deflation. Table 53 showed hourly earnings per capita for all groups in 1921 to be 57 cents; Table 64 shows that 57 cents in 1921 would buy about as much as 32 cents would buy in 1914. The average hourly earnings of men in 1921 were 64 cents, which had the purchasing power of 36 cents in 1914. When the deflated figures for women and children are taken, or, in the South, even the figures for all sex and age groups combined, one

can not fail to be impressed by the very low purchasing power revealed by the figures.

The amounts of real hourly earnings for each census year since 1899 and for 34 of our selected industries are shown in Table 66. In Table 67, 16 of these industries are still further divided in order to indicate the real hourly earnings of men and women separately.

TABLE 64.—PURCHASING POWER (AT 1914 PRICES) OF ESTIMATED AMOUNTS OF NOMINAL HOURLY EARNINGS, IN THE UNITED STATES, ALL INDUSTRIES COMBINED, BY SEX AND AGE GROUPS, CENSUS YEARS: 1899–1921

CENSUS YEAR	SEX AND AGE GROUP			
	All groups	Men over 16	Women over 16	Children under 16
	CENTS PER HOUR			
1899	23	26	14	8
1904	24	27	14	8
1909	26	28	15	9
1914	26	29	15	9
1919	31	35	19	11
1921	32	36	19	11

TABLE 65.—PURCHASING POWER (AT 1914 PRICES) OF ESTIMATED AMOUNTS OF NOMINAL HOURLY EARNINGS IN THE UNITED STATES, ALL INDUSTRIES COMBINED, BY GEOGRAPHIC DIVISIONS, CENSUS YEARS: 1899–1921

GEOGRAPHIC DIVISION	1899	1904	1909	1914	1919	1921
	CENTS PER HOUR					
United States	23	24	26	26	31	32
New England	23	23	24	24	28	29
Middle Atlantic	25	25	26	26	33	34
East North Central	25	26	28	29	34	36
West North Central	25	26	27	28	29	34
South Atlantic	15	16	17	18	24	23
East South Central	17	18	18	19	22	22
West South Central	18	21	21	21	24	25
Mountain	33	36	35	34	33	37
Pacific	28	32	35	34	38	40

TABLE 66.—PURCHASING POWER (AT 1914 PRICES) OF NOMINAL HOURLY EARNINGS OF MALE WAGE EARNERS, BY SELECTED INDUSTRIES, CENSUS YEARS: 1899–1921

INDUSTRY	1899	1904	1909	1914	1919	1921
	CENTS PER HOUR					
All industries	26.1	26.9	28.5	28.6	34.5	36.2
Bread and other bakery products	23.9	25.6	21.7	27.3	30.3	36.7
Flour-mill and gristmill products	30.0	27.9	29.0	29.2	32.1	36.0
Confectionery	26.7	26.5	27.8	28.3	30.1	35.0
Liquors, malt	33.9	34.8	35.4	36.8	32.0	39.4
Mineral and soda waters	21.4	21.4	21.6	20.8	20.1	25.0
Tobacco, cigars and cigarettes	24.7	24.0	24.2	24.4	24.0	13.4
Carpets and rugs, other than rag	24.2	23.7	51.1	23.8	32.3	39.9
Shirts	26.3	25.3	27.2	26.4	28.9	33.3
Clothing, men's	31.5	32.3	35.1	40.3	50.4	55.5
Clothing, women's	31.2	32.6	36.4	35.3	49.2	54.4
Dyeing and finishing textiles, exclusive of that done in textile mills	24.3	22.9	24.4	23.5	29.4	33.0
Knit goods	20.9	19.9	21.7	22.8	25.2	28.9
Silk goods, including throwsters	27.0	25.9	26.4	28.5	35.6	39.4
Boots and shoes, not including rubber boots and shoes	30.5	31.3	32.8	32.4	36.6	41.9
Leather, tanned, curried, and finished	22.4	22.7	24.0	23.5	31.5	30.8
Furniture	26.3	26.9	29.3	22.6	30.6	36.3
Lumber, timber products	18.4	21.2	19.7	19.6	23.8	20.4
Lumber, planing-mill products, not including planing mills connected with sawmills	25.7	27.2	28.9	29.1	27.9	34.2
Paper and wood pulp	19.4	20.8	22.3	22.5	28.6	29.3
Printing and publishing, book and job	31.8	33.5	37.5	37.3	34.6	47.7
Printing and publishing, newspapers and periodicals	33.4	35.5	37.8	37.6	32.7	45.7
Chemicals		24.4	25.8	26.0	32.2	32.8
Petroleum refining	27.6	27.7	31.7	30.2	38.3	41.6
Glass	33.3	35.3	33.2	34.4	36.0	40.7
Iron and steel, blast furnaces	20.4	21.7	24.8	27.5	38.7	35.1
Iron and steel, steel works and rolling mills	29.0	28.4	31.7	31.8	42.8	45.3
Foundry and machine-shop products	33.1	34.1	35.4	34.3	39.2	40.7
Automobile bodies and parts		24.2	27.5	28.9	32.3	34.2
Automobiles	31.3	29.7	30.8	36.5	38.4	41.2
Cars, steam-railroad, not including operations of railroad companies	25.8	28.3	28.7	31.2	37.1	37.9
Railroad repair shops—electric	33.9	31.9	31.2	30.6	32.7	38.6
Railroad repair shops—steam	31.1	31.5	32.6	31.7	39.5	45.8
Agricultural implements	26.6	26.9	28.0	31.4	31.9	36.1
Shipbuilding, steel	26.3	26.3	27.6	32.0	44.2	41.8
Electrical machinery, apparatus, and supplies	27.8	27.9	29.0	28.4	31.2	34.8

TABLE 67.—PURCHASING POWER (AT 1914 PRICES) OF ESTIMATED AMOUNTS OF NOMINAL HOURLY EARNINGS OF MALE AND FEMALE WAGE EARNERS IN 16 SELECTED INDUSTRIES, CENSUS YEARS: 1899–1921

INDUSTRY	1899	1904	1909	1914	1919	1921
	CENTS PER HOUR					
All industries:						
Male	26.1	26.9	28.5	28.6	34.5	36.2
Female	14.0	14.4	15.3	15.3	18.5	19.4
Bread and other bakery products:						
Male	23.9	25.6	21.7	27.3	30.3	36.7
Female	11.2	12.0	13.4	12.8	14.3	17.3
Confectionery:						
Male	26.7	26.5	27.8	28.3	30.1	35.0
Female	12.3	12.2	12.8	13.1	13.9	16.2

TABLE 67.—PURCHASING POWER (AT 1914 PRICES) OF ESTIMATED AMOUNTS OF NOMINAL HOURLY EARNINGS OF MALE AND FEMALE WAGE EARNERS IN 16 SELECTED INDUSTRIES, CENSUS YEARS: 1899–1921—Continued

INDUSTRY	1899	1904	1909	1914	1919	1921
	CENTS PER HOUR					
Mineral and soda waters:						
Male	21.4	21.4	21.6	20.8	20.1	25.0
Female	10.8	10.9	10.9	12.1	10.2	12.7
Tobacco, cigars and cigarettes:						
Male	24.7	24.0	24.2	24.4	24.0	13.4
Female	13.7	13.3	13.4	13.5	13.3	13.8
Carpets and rugs, other than rag:						
Male	24.2	23.7	51.1	23.8	32.3	39.9
Female	15.5	15.2	16.5	15.2	20.7	26.6
Shirts:						
Male	26.3	25.3	27.2	26.4	28.9	33.3
Female	14.3	13.8	14.8	14.3	15.7	18.1
Clothing, men's:						
Male	31.5	32.3	35.1	40.3	50.4	55.5
Female	15.3	15.0	16.3	15.1	22.1	27.1
Clothing, women's:						
Male	31.2	32.6	36.4	35.3	49.2	54.4
Female	16.5	17.2	19.2	18.6	26.0	28.7
Dyeing and finishing textiles, exclusive of that done in textile mills:						
Male	24.3	22.9	24.4	23.5	29.4	33.0
Female	14.7	13.8	14.7	14.2	17.7	19.9
Knit goods:						
Male	20.9	19.9	21.7	22.8	25.2	28.9
Female	14.0	13.3	14.5	15.3	16.9	19.3
Silk goods, including throwsters:						
Male	27.0	25.9	26.4	28.5	35.6	39.4
Female	15.9	15.3	16.7	15.0	21.0	23.2
Boots and shoes, not including rubber boots and shoes:						
Male	30.5	31.3	32.8	32.4	36.6	41.9
Female	18.6	19.1	20.0	19.8	22.3	25.6
Printing and publishing, book and job:						
Male	31.8	33.5	37.5	37.3	34.6	47.7
Female	16.0	16.9	18.9	18.8	17.5	24.1
Printing and publishing, newspapers and periodicals:						
Male	33.4	35.5	37.8	37.6	32.7	45.7
Female	15.0	16.0	17.0	16.9	14.7	20.6
Glass:						
Male	33.3	35.3	33.2	34.4	36.0	40.7
Female	10.7	11.3	10.6	11.0	11.5	13.0
Electrical machinery, apparatus, and supplies:						
Male	27.8	27.9	29.0	28.4	31.2	34.8
Female	15.0	15.1	15.7	15.4	16.9	18.8

TABLE 68.—ESTIMATED AMOUNTS OF REAL EARNINGS, PER CAPITA, ALL INDUSTRIES COMBINED, BY GEOGRAPHIC REGIONS AND DIVISIONS, AND BY STATES, CENSUS YEARS: 1899–1923

[Based on purchasing power of the dollar in 1914]

REGION, DIVISION, AND STATE	1899	1904	1909	1914	1919	1921	1923
UNITED STATES	$603	$582	$640	$576	$677	$595	$839
NORTHEAST	618	599	657	597	774	598	847
New England	570	547	595	524	664	507	699
Middle Atlantic	616	592	649	571	775	593	888
East North Central	627	637	692	656	843	653	900
West North Central	615	625	679	624	721	611	756
SOUTH	415	430	463	430	536	436	577
South Atlantic	399	402	443	415	545	431	569
East South Central	438	453	466	430	518	427	580
West South Central	486	523	532	497	548	478	601
WEST	782	831	914	776	789	710	943
Mountain	881	902	918	805	756	721	921
Pacific	751	808	934	768	797	706	952

TABLE 68.—ESTIMATED AMOUNTS OF REAL EARNINGS, PER CAPITA, ALL INDUSTRIES COMBINED, BY GEOGRAPHIC REGIONS AND DIVISIONS, AND BY STATES, CENSUS YEARS: 1899–1923—Continued

REGION, DIVISION, AND STATE	1899	1904	1909	1914	1919	1921	1923
NEW ENGLAND	$570	$547	$595	$524	$664	$507	$699
Maine	507	533	578	526	693	538	685
New Hampshire	522	512	556	506	615	485	646
Vermont	522	524	585	530	621	496	655
Massachusetts	584	548	597	530	663	511	704
Rhode Island	543	520	577	502	617	497	678
Connecticut	631	586	637	546	717	507	821
MIDDLE ATLANTIC	616	592	649	571	775	593	888
New York	615	589	659	573	743	610	818
New Jersey	622	589	641	564	775	591	843
Pennsylvania	627	595	647	574	817	576	824
EAST NORTH CENTRAL	627	637	692	656	843	653	900
Ohio	632	635	702	643	874	641	904
Indiana	622	604	662	636	789	629	844
Illinois	678	689	743	687	821	686	904
Michigan	577	593	662	703	923	703	991
Wisconsin	589	605	663	603	752	572	780
WEST NORTH CENTRAL	615	625	679	624	721	611	756
Minnesota	647	658	722	655	747	638	782
Iowa	570	578	663	642	744	625	763
Missouri	611	620	662	593	669	580	731
North Dakota	670	705	772	726	772	720	882
South Dakota	704	698	786	696	808	669	753
Nebraska	641	649	687	659	806	647	773
Kansas	636	633	700	609	759	626	767
SOUTH ATLANTIC	399	402	443	415	545	431	569
Delaware	550	522	578	495	808	521	711
Maryland	493	484	536	499	708	520	679
District of Columbia	607	614	687	588	611	653	862
Virginia	432	424	444	430	585	481	620
West Virginia	531	578	625	601	704	641	834
North Carolina	247	273	310	297	421	313	436
South Carolina	249	258	311	303	417	307	401
Georgia	316	336	383	337	447	333	414
Florida	474	498	537	480	576	439	580
EAST SOUTH CENTRAL	438	453	466	430	518	427	586
Kentucky	489	483	507	474	546	518	689
Tennessee	427	433	445	414	470	412	539
Alabama	409	441	476	437	555	416	591
Mississippi	401	448	438	390	498	344	467
WEST SOUTH CENTRAL	486	523	532	497	548	478	601
Arkansas	388	458	448	416	472	357	480
Louisiana	485	528	516	480	536	433	555
Oklahoma	504	594	640	592	656	634	814
Texas	561	548	597	533	569	531	648
MOUNTAIN	881	902	918	805	756	721	921
Montana	1,005	1,107	1,083	880	791	698	955
Idaho	818	901	900	914	855	776	1,017
Wyoming	947	958	1,025	871	1,125	1,098	1,259
Colorado	870	861	885	748	726	716	878
New Mexico	673	742	755	691	668	538	772
Arizona	1,007	983	1,021	870	1,173	697	902
Utah	676	727	813	720	616	647	764
Nevada	1,018	1,081	1,113	991	828	864	1,133
PACIFIC	751	808	934	768	797	706	952
Washington	793	843	916	787	888	687	960
Oregon	677	766	864	727	822	628	877
California	750	806	917	772	749	741	971

TABLE 69.—ESTIMATED AMOUNTS OF "REAL" EARNINGS, PER CAPITA, IN THE UNITED STATES, BY SELECTED INDUSTRIES AND BY SEX, CENSUS YEARS: 1899–1925

INDUSTRY AND SEX	1899	1904	1909	1914	1919	1921	1923	1925
Bread and other bakery products:								
Male	$581	$660	$708	$591	$646	$718	$759	$764
Female	273	311	333	278	305	339	357	359
Flour-mill and grain-mill products:								
Male	584	582	601	549	598	609	633	639
Confectionery:								
Male	623	583	628	642	656	702	796	852
Female	288	271	291	297	304	325	364	395
Slaughtering and meat packing:								
Male	664	693	679	613	829	726	859	825
Liquors, malt:								
Male	808	823	801	794	698	726	924	-------
Mineral and soda waters:								
Male	551	560	518	512	484	497	663	-------
Female	280	284	263	260	246	253	337	-------
Tobacco, cigars and cigarettes:								
Male	596	564	551	529	507	510	560	575
Female	330	312	306	294	302	284	311	319
Carpets and rugs, other than rag:								
Male	612	571	645	547	668	773	985	895
Female	392	366	413	350	428	495	631	573
Shirts:								
Male	643	587	656	592	567	622	725	642
Female	350	319	356	322	309	338	395	349
Clothing, men's:								
Male	750	730	823	743	907	956	1,099	964
Female	350	341	385	346	423	445	512	450
Clothing, women's:								
Male	731	728	843	758	886	939	1,133	1,074
Female	385	384	445	400	468	495	598	566
Cotton manufactures:								
Male	495	458	517	497	583	559	645	597
Female	386	358	403	388	456	438	505	466
Dyeing and finishing textiles, exclusive of that done in textile mills:								
Male	623	557	617	552	597	647	764	720
Female	377	336	371	333	361	390	461	435
Knit goods:								
Male	528	483	549	532	526	578	712	676
Female	355	324	369	357	353	388	478	454
Silk goods, including throwsters:								
Male	658	607	702	663	706	753	946	918
Female	388	358	414	391	416	445	557	542
Woolen and worsted goods:								
Male	414	472	551	477	533	599	758	656
Female	297	339	394	343	383	431	543	470
Boots and shoes, not including rubber boots and shoes:								
Male	742	719	782	695	750	769	894	806
Female	476	460	500	444	480	492	572	516
Leather, tanned, curried, and finished:								
Male	577	546	600	522	683	592	893	649
Furniture:								
Male	634	624	683	616	666	704	957	1,020
Lumber and timber products:								
Male	468	524	490	458	559	440	638	662
Lumber, planing-mill products, not including planing mills connected with sawmills:								
Male	607	633	678	624	608	662	898	954
Paper and wood pulp:								
Male	604	608	670	615	717	661	865	832
Printing and publishing, book and job:								
Male	793	770	849	780	781	1,006	1,191	1,202
Female	400	389	429	394	394	508	592	608
Printing and publishing, newspapers and periodicals:								
Male	777	782	862	797	743	991	1,177	1,242
Female	350	352	389	359	335	447	529	560
Chemicals:								
Male	-------	643	652	641	702	583	805	813
Petroleum refining:								
Male	888	706	771	750	823	761	950	957
Brick and tile, terra-cotta, and fire-clay products:								
Male	493	600	662	565	663	625	890	884
Glass:								
Male	858	837	732	802	793	762	985	971
Female	281	273	239	262	259	249	322	318

TABLE 69.—ESTIMATED AMOUNTS OF "REAL" EARNINGS, PER CAPITA, IN THE UNITED STATES, BY SELECTED INDUSTRIES AND BY SEX, CENSUS YEARS: 1899–1925—Continued

INDUSTRY AND SEX	1899	1904	1909	1914	1919	1921	1923	1925
Iron and steel, blast furnaces:								
Male	$646	$611	$760	$689	$993	$658	$1,046	$948
Iron and steel, steel works and rolling mills:								
Male	770	675	816	673	965	584	1,085	1,024
Foundry and machine-shop products:								
Male	797	727	817	674	810	627	1,025	1,013
Smelting and refining, copper, lead, and zinc:								
Male	688	694	708	619	606	422	736	692
Automobile bodies and parts:								
Male		507	620	605	614	475	810	877
Automobiles:								
Male	688	600	670	737	714	556	943	984
Cars, steam-railroad, not including operations of railroad companies:								
Male	493	469	494	535	660	494	821	789
Railroad repair shops—electric:								
Male	811	711	747	655	685	588	897	892
Railroad repair shops—steam:								
Male	719	671	748	641	779	664	943	875
Agricultural implements:								
Male	558	523	594	586	615	564	745	724
Rubber tires, tubes, and rubber goods:								
Male	591	565	721	657	845	703	986	1,054
Shipbuilding, steel:								
Male	547	507	583	555	709	573	757	745
Electrical machinery, apparatus, and supplies:								
Male	562	522	593	511	563	519	740	748
Female	304	282	321	276	304	281	399	436

TABLE 70.—PURCHASING POWER (AT 1914 PRICES) OF ESTIMATED AMOUNTS OF PER CAPITA MONEY EARNINGS OF MALE AND FEMALE WAGE EARNERS IN TWO LEADING STATES, IN SELECTED INDUSTRIES, CENSUS YEARS: 1899–1921

SELECTED INDUSTRY	CENSUS YEAR AND SEX											
	1899		1904		1909		1914		1919		1921	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Tobacco, cigars and cigarettes:												
Florida	$630	$322	$676	$346	$647	$331	$587	$300	$542	$277	$514	$263
Pennsylvania	482	295	452	275	440	268	389	236	469	285	496	266
Clothing, men's:												
New York	807	412	722	367	792	403	683	349	936	477	964	491
Illinois	723	354	782	383	755	369	788	385	966	473	1,107	541
Clothing, women's:												
New York	799	469	745	436	869	509	775	455	951	558	1,013	594
Illinois	800	342	975	417	1,069	457	983	420	1,065	454	1,101	471
Cotton manufactures:												
Massachusetts	543	432	488	388	575	457	512	407	613	488	588	468
North Carolina	286	207	305	222	384	278	370	268	495	359	414	299
Knit goods:												
Pennsylvania	557	338	514	312	563	343	574	349	579	351	674	409
New York	557	435	498	389	597	466	540	422	540	422	611	477
Shirts:												
New York	677	412	588	358	680	414	585	354	694	377	688	421
Pennsylvania	772	289	752	282	816	306	719	269	612	230	681	256
Silk goods, including throwsters:												
Pennsylvania	505	314	522	322	634	393	620	385	664	411	743	459
New Jersey	708	484	634	434	759	518	725	495	761	520	787	538
Woolen goods:												
Massachusetts	511	378	502	372	546	405	510	379	601	446	619	459
Pennsylvania	574	394	504	337	583	390	546	365	695	465	652	437

TABLE 70.—PURCHASING POWER (AT 1914 PRICES) OF ESTIMATED AMOUNTS OF PER CAPITA MONEY EARNINGS OF MALE AND FEMALE WAGE EARNERS IN TWO LEADING STATES, IN SELECTED INDUSTRIES, CENSUS YEARS: 1899–1921—Continued

SELECTED INDUSTRY	CENSUS YEAR AND SEX											
	1899		1904		1909		1914		1919		1921	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Worsted goods:												
Massachusetts	$584	$386	$539	$357	$623	$413	$580	$384	$639	$423	$666	$441
Pennsylvania	585	361	558	343	611	377	586	361	730	450	712	439
Boots and shoes, not including rubber boots and shoes:												
Massachusetts	757	504	746	498	795	530	726	484	720	481	745	497
Missouri	665	436	701	461	798	524	666	437	611	401	720	473
Leather, tanned, curried, and finished:												
Massachusetts	616	-----	563	-----	600	-----	552	-----	649	-----	630	-----
Pennsylvania	559	-----	540	-----	592	-----	557	-----	697	-----	640	-----
Furniture:												
New York	615	-----	592	-----	630	-----	556	-----	612	-----	667	-----
Michigan	534	-----	549	-----	600	-----	568	-----	617	-----	682	-----
Lumber and timber products:												
Washington	755	-----	814	-----	857	-----	753	-----	877	-----	656	-----
Louisiana	435	-----	543	-----	498	-----	505	-----	566	-----	407	-----
Lumber, planing-mill products, not including planing mills connected with sawmills:												
New York	626	-----	637	-----	676	-----	603	-----	631	-----	728	-----
California	808	-----	893	-----	993	-----	839	-----	720	-----	774	-----
Paper and wood pulp:												
New York	536	-----	541	-----	585	-----	538	-----	642	-----	648	-----
Maine	574	-----	599	-----	683	-----	615	-----	687	-----	720	-----
Printing and publishing, newspapers and periodicals:												
New York	947	420	931	414	1,006	447	919	409	793	352	1,030	458
Illinois	657	276	767	322	776	325	701	294	631	264	902	378
Printing and publishing, book and job:												
New York	834	454	767	419	838	456	758	413	811	442	988	538
Illinois	789	362	824	377	898	411	860	394	874	399	1,018	466
Glass:												
Pennsylvania	862	335	911	354	822	320	759	295	852	331	734	285
West Virginia	757	172	976	220	984	223	868	197	940	213	927	210
Iron and steel, blast furnaces:												
Pennsylvania	626	-----	605	-----	730	-----	727	-----	992	-----	663	-----
Alabama	385	-----	475	-----	692	-----	563	-----	821	-----	572	-----
Iron and steel, steel works and rolling mills:												
Pennsylvania	701	-----	622	-----	739	-----	646	-----	903	-----	522	-----
Ohio	747	-----	722	-----	826	-----	731	-----	993	-----	570	-----
Foundry and machine-shop products:												
Ohio	718	-----	678	-----	777	-----	692	-----	809	-----	583	-----
New York	800	-----	724	-----	830	-----	727	-----	787	-----	591	-----
Agricultural implements:												
Illinois	627	-----	625	-----	691	-----	792	-----	671	-----	557	-----
Indiana	611	-----	584	-----	632	-----	596	-----	738	-----	481	-----
Electrical machinery, apparatus, and supplies:												
New York	623	311	557	278	668	332	555	277	584	291	436	218
Illinois	643	346	622	334	823	441	743	399	658	353	638	342
Chemicals:												
New Jersey	726	-----	673	-----	717	-----	671	-----	720	-----	663	-----
New York	680	-----	671	-----	702	-----	669	-----	779	-----	621	-----

TABLE 71.—PURCHASING POWER, AT PRICES OF 1923, OF ESTIMATED AMOUNTS OF MANUFACTURING LABOR INCOMES, PER CAPITA, BY STATES: 1899, 1914, AND 1923

[Ranked by amounts of earnings in 1923]

STATE	1899	1914	1923	STATE	1899	1914	1923
United States	$1,014	$976	$1,317	New Mexico	$1,132	$1,171	$1,305
				Kansas	1,070	1,032	1,297
Wyoming	1,593	1,476	2,128	Utah	1,136	1,220	1,292
Nevada	1,711	1,680	1,914	Iowa	959	1,088	1,290
Idaho	1,375	1,549	1,719	South Dakota	1,184	1,180	1,272
Michigan	970	1,192	1,675				
California	1,261	1,308	1,641	Missouri	1,027	1,005	1,236
				Delaware	925	839	1,201
Washington	1,334	1,334	1,623	Massachusetts	982	898	1,189
Montana	1,691	1,492	1,614	Kentucky	823	803	1,164
Illinois	1,141	1,164	1,528	Maine	852	892	1,157
Ohio	1,064	1,090	1,527				
Arizona	1,693	1,475	1,524	Maryland	830	846	1,148
				Rhode Island	914	851	1,145
North Dakota	1,127	1,231	1,491	Vermont	877	898	1,107
Colorado	1,464	1,268	1,484	Texas	943	903	1,095
Oregon	1,139	1,232	1,482	New Hampshire	877	858	1,091
District of Columbia	1,020	997	1,457				
Indiana	1,045	1,078	1,426	Virginia	727	727	1,047
				Alabama	689	741	998
New Jersey	1,045	956	1,425	Florida	798	814	980
West Virginia	893	1,017	1,410	Louisiana	816	814	938
Pennsylvania	1,055	973	1,392	Tennessee	718	702	911
Connecticut	1,061	925	1,388				
New York	1,034	971	1,383	Arkansas	652	705	811
				Mississippi	675	661	789
Oklahoma	848	1,003	1,376	North Carolina	416	503	736
Minnesota	1,089	1,110	1,321	Georgia	532	571	699
Wisconsin	991	1,022	1,318	South Carolina	418	514	678
Nebraska	1,077	1,117	1,307				

Chapter VI

COMPARISON OF THE PURCHASING POWER OF ACTUAL AND FULL-TIME EARNINGS

The material presented in this chapter runs closely parallel with that given in Chapter III. The earlier chapter made a comparison between the money amounts of actual and full-time earnings and this present chapter proposes to make a similar comparison between the "real" amounts, or purchasing power, of actual and full-time earnings. In Table 72 the annual series of deflated earnings, both full-time and actual, is given for the United States as a whole, all industries combined. The discrepancy between actual and hypothetical full-time earnings varies widely between successive years with, as we should naturally expect, a closer approximation of actual to full-time earnings in such years of prosperity as 1920 than in depression years like 1914 and 1921.

TABLE 72.—PURCHASING POWER OF ACTUAL AND FULL-TIME EARNINGS, IN THE UNITED STATES, ALL INDUSTRIES COMBINED, EACH YEAR: 1899–1927

YEAR	PURCHASING POWER OF—		YEAR	PURCHASING POWER OF—	
	Full-time earnings	Actual earnings		Full-time earnings	Actual earnings
1899	$710	$603	1914	$719	$576
1900	716	591	1915	747	620
1901	708	604	1916	791	718
1902	708	621	1917	760	667
1903	789	593	1918	818	703
1904	711	582	1919	801	677
1905	725	646	1920	840	726
1906	728	660	1921	831	595
1907	714	636	1922	858	705
1908	739	570	1923	927	839
1909	739	645	1924	923	776
1910	711	608	1925	931	825
1911	697	562	1926	931	830
1912	713	617	1927	943	805
1913	719	623			

COMPARISON OF SEX AND AGE GROUPS

A summary for census years, classified by sex and age groups, is given in Table 73. Judging from these figures there would seem to be no great difference as between men and women employees, or

between women and children, in respect to the proportion of purchasing power lost because of failure to work full time. There seems to be a slight difference in favor of women and children as compared with men; that is to say, it would appear that in the case of men the loss in purchasing power because of the discrepancy between actual and full-time employment is somewhat greater than in the case of women and children.

TABLE 73.—PURCHASING POWER (AT 1914 PRICES) OF ACTUAL AND FULL-TIME EARNINGS, PER CAPITA, IN THE UNITED STATES, ALL INDUSTRIES COMBINED, BY SEX AND AGE GROUPS, CENSUS YEARS: 1899–1923

YEAR AND TYPE OF ANNUAL EARNINGS	All wage earners	Men	Women	Children
1899—Full-time earnings	$710	$793	$429	$242
Actual earnings	603	673	361	205
1904—Full-time earnings	711	794	425	241
Actual earnings	582	651	348	198
1909—Full-time earnings	739	838	449	255
Actual earnings	640	725	390	221
1914—Full-time earnings	719	804	430	244
Actual earnings	576	644	344	195
1919—Full-time earnings	801	894	479	272
Actual earnings	677	756	406	195
1921—Full-time earnings	831	928	497	282
Actual earnings	595	665	356	230
1923—Full-time earnings	927	1,021	547	311
Actual earnings	839	924	495	281

REGIONAL DIFFERENCES IN LOST TIME

A summary, by geographic regions, is given in Table 74. This table gives the deflated amounts corresponding to the full-time money sums shown in Table 33 alongside the figures showing the purchasing power of actual earnings. These figures show large variations in the amount of purchasing power that is lost because of unemployment and irregular employment. The dollar amounts by which this loss is represented are, of course, smaller in the South than in the North, where earnings are higher, but they constitute on the whole, at least as large a proportion of actual earnings as in the West and Northeast. The loss of such large proportions of hypothetical full-time earnings in 1921 in the South Atlantic division—about 30 per cent; in the Middle Atlantic division, in the same year, 31 per cent—can be afforded least of all by industrial workers in the South, because of the very fact of their lower actual earnings, which forces them, of course, nearer to the line of bare subsistence and doubtless make necessary for them a distinctly lower standard of living. Obviously, wage earners who are working on a full-time yearly

(salary) scale of around $600 can less afford to lose nearly one-third of that sum through failure to secure full-time employment than their fellow workers of the Middle Atlantic division can spare one-third of their full-time yearly scale of around $800.

TABLE 74.—PURCHASING POWER (AT 1914 PRICES) OF ACTUAL AND FULL-TIME PER CAPITA EARNINGS, ALL INDUSTRIES COMBINED, BY GEOGRAPHIC DIVISIONS, CENSUS YEARS: 1899–1923

GEOGRAPHIC DIVISIONS AND TYPE OF EARNINGS	1899	1904	1909	1914	1919	1921	1923
UNITED STATES							
Full-time earnings	$710	$711	$739	$719	$801	$831	$927
Actual earnings	603	582	640	576	677	595	839
NORTHEAST							
New England:							
Full-time earnings	692	670	691	651	706	734	826
Actual earnings	570	547	595	524	664	507	699
Middle Atlantic:							
Full-time earnings	747	724	753	709	823	857	1,050
Actual earnings	616	592	649	571	775	593	888
East North Central:							
Full-time earnings	759	780	802	815	896	944	1,064
Actual earnings	627	637	692	656	843	653	900
West North Central:							
Full-time earnings	746	765	789	775	766	884	894
Actual earnings	615	625	679	624	721	611	756
SOUTH							
South Atlantic:							
Full-time earnings	481	504	524	531	661	618	646
Actual earnings	399	402	443	415	545	431	569
East South Central:							
Full-time earnings	528	567	552	551	628	612	657
Actual earnings	438	453	466	430	518	427	580
West South Central:							
Full-time earnings	588	654	631	636	664	685	682
Actual earnings	486	523	532	497	548	478	601
WEST							
Mountain:							
Full-time earnings	1,003	1,064	1,025	971	864	973	983
Actual earnings	831	902	918	805	756	721	921
Pacific:							
Full-time earnings	855	953	1,043	926	910	953	1,016
Actual earnings	751	808	934	768	797	706	952

VARIATIONS AMONG THE INDUSTRIES

Comparisons similar to those which have been made in the foregoing summary tables are given in considerably greater detail for our selected industries, or for those for which data are available, in Tables 75 and 76. The former makes the comparison for male wage earners and the latter for female wage earners. These tables correspond to similar tables in Chapter III, the only difference being that in these present tables the figures are deflated so that the comparisons run between dollar amounts having uniform purchasing power. The data of Table 75 are shown in graphic form in Figure 23.

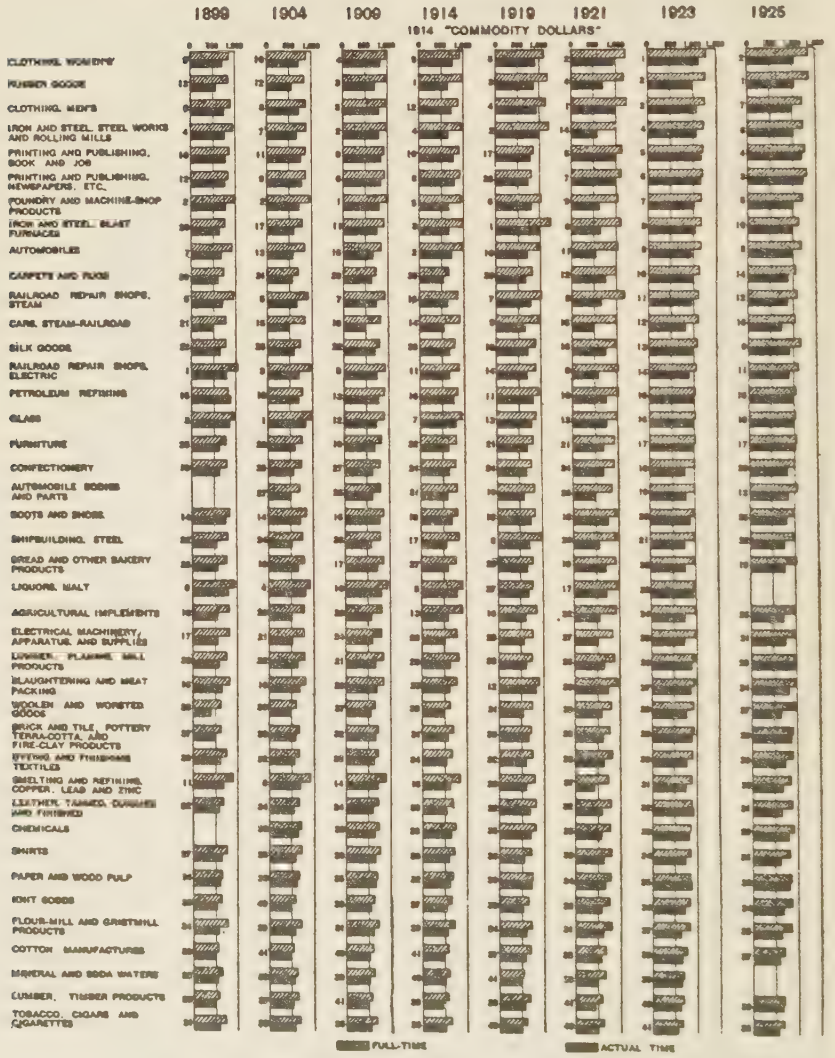


FIG. 23.—PURCHASING POWER OF ACTUAL AND FULL-TIME EARNINGS, PER CAPITA, BY SELECTED INDUSTRIES, MALE WAGE EARNERS

TABLE 75.—PURCHASING POWER (AT 1914 PRICES) OF ESTIMATED AMOUNTS OF ACTUAL AND FULL-TIME PER CAPITA EARNINGS, BY INDUSTRIES, FOR MALE WAGE EARNERS, CENSUS YEARS: 1899–1925

INDUSTRY AND TYPE OF EARNINGS	1899	1904	1909	1914	1919	1921	1923	1925
Bread and other bakery products:								
Full-time earnings	$762	$804	$851	$773	$1,002	$849	$878	$1,012
Actual earnings	561	600	719	641	848	718	756	784
Flour and grain mill products:								
Full-time earnings	799	779	721	712	725	852	815	842
Actual earnings	544	532	611	549	560	634	632	650
Confectionery:								
Full-time earnings	802	796	768	792	792	922	1,011	1,059
Actual earnings	623	623	652	642	656	704	796	812
Slaughtering and meat packing:								
Full-time earnings	778	780	850	761	969	869	898	974
Actual earnings	664	642	676	642	826	726	756	825
Liquors, malt:								
Full-time earnings	852	904	925	912	794	969	970	.....
Actual earnings	809	823	911	794	966	726	904	.....
Malting and malt liquors:								
Full-time earnings	881	921	926	960	945	986	799	.....
Actual earnings	861	899	1,018	842	424	647	903	.....
Tobacco, cigars and cigarettes:								
Full-time earnings	724	690	674	642	811	828	872	894
Actual earnings	666	664	661	626	667	616	669	676
Carpets and rugs, other than rag:								
Full-time earnings	726	701	749	857	825	1,002	1,144	1,091
Actual earnings	612	671	845	647	668	772	865	845
Silks:								
Full-time earnings	776	780	793	711	764	895	842	818
Actual earnings	643	667	696	642	667	622	728	642
Clothing, men's:								
Full-time earnings	906	890	967	868	1,127	1,256	1,276	1,225
Actual earnings	750	780	828	743	967	908	1,009	964
Clothing, women's:								
Full-time earnings	881	862	970	911	1,101	1,218	1,216	1,284
Actual earnings	731	726	842	756	896	984	1,128	1,074
Cotton manufactures:								
Full-time earnings	674	640	666	674	852	673	746	702
Actual earnings	496	492	617	497	652	509	642	567
Dyeing and finishing textiles, except of wool, cotton or silk mills:								
Full-time earnings	751	822	777	804	741	825	868	911
Actual earnings	622	657	817	652	847	647	764	720
Knit goods:								
Full-time earnings	722	692	670	636	824	746	827	850
Actual earnings	626	652	649	622	696	576	712	676
Silk goods, including throwsters:								
Full-time earnings	762	745	816	767	877	976	1,006	1,167
Actual earnings	658	697	702	662	706	762	846	918
Woolen and worsted goods:								
Full-time earnings	626	617	647	626	742	806	806	855
Actual earnings	414	472	561	477	623	666	756	666
Boots and shoes, not including rubber boots and shoes:								
Full-time earnings	828	840	894	829	841	958	966	972
Actual earnings	742	776	752	666	750	796	864	808
Leather, tanned, curried, and finished:								
Full-time earnings	806	821	796	877	811	796	956	954
Actual earnings	677	646	660	622	652	642	648	649
Furniture:								
Full-time earnings	785	779	832	801	812	896	1,022	1,045
Actual earnings	624	634	662	616	666	704	867	1,000
Lumber, sawmill products:								
Full-time earnings	578	652	566	566	652	656	652	670
Actual earnings	466	524	460	456	559	440	526	522
Lumber, planing mill products:								
Full-time earnings	751	758	826	811	741	850	950	977
Actual earnings	607	622	678	634	606	662	806	864
Paper and wood pulp:								
Full-time earnings	841	894	907	863	784	786	886	895
Actual earnings	604	606	670	615	717	661	805	822
Printing and publishing, book and job:								
Full-time earnings	881	852	928	906	847	1,123	1,222	1,270
Actual earnings	798	770	849	750	751	1,006	1,101	1,202
Printing and publishing, newspaper and periodical:								
Full-time earnings	894	866	940	926	856	1,106	1,208	1,216
Actual earnings	777	752	862	767	742	961	1,177	1,242
Chemicals:								
Full-time earnings	.....	708	787	752	758	799	848	916
Actual earnings	.....	643	662	641	702	662	806	813

TABLE 75.—PURCHASING POWER (AT 1914 PRICES) OF ESTIMATED AMOUNTS OF ACTUAL AND FULL-TIME PER CAPITA EARNINGS, BY INDUSTRIES, FOR MALE WAGE EARNERS, CENSUS YEARS: 1899–1925—Continued

INDUSTRY AND TYPE OF EARNINGS	1899	1904	1909	1914	1919	1921	1923	1925
Petroleum refining:								
Full-time earnings	$831	$806	$907	$856	$953	$1,034	$1,032	$1,059
Actual earnings	888	706	771	750	823	761	950	957
Brick and tile, pottery, terra-cotta, and fire-clay products:								
Full-time earnings	628	683	723	703	719	796	902	917
Actual earnings	493	600	662	565	663	625	890	884
Glass:								
Full-time earnings	964	988	915	919	884	997	1,029	1,032
Actual earnings	858	837	732	802	793	762	985	971
Iron and steel, blast furnaces:								
Full-time earnings	797	817	920	969	1,238	1,120	1,195	1,145
Actual earnings	646	611	760	680	993	658	1,046	948
Iron and steel, steel works and rolling mills:								
Full-time earnings	950	901	989	958	1,204	995	1,240	1,236
Actual earnings	770	675	816	673	965	584	1,085	1,024
Foundry and machine-shop products:								
Full-time earnings	995	975	1,005	954	1,021	1,034	1,196	1,237
Actual earnings	797	727	817	674	810	627	1,025	1,013
Smelting and refining, copper, lead, and zinc:								
Full-time earnings	881	902	895	839	787	749	878	859
Actual earnings	688	694	708	619	606	422	736	682
Automobile bodies and parts:								
Full-time earnings	----	723	807	810	835	883	1,011	1,066
Actual earnings	----	507	620	605	614	475	810	877
Automobiles:								
Full-time earnings	931	855	872	987	972	1,033	1,177	1,195
Actual earnings	688	600	670	737	714	556	943	984
Cars, steam-railroad, not including operations of railroad companies:								
Full-time earnings	797	836	837	888	973	993	1,108	1,053
Actual earnings	493	469	494	535	660	494	821	739
Railroad repair shops—electric:								
Full-time earnings	1,068	971	936	895	883	1,035	1,059	1,109
Actual earnings	811	711	747	655	685	588	897	892
Railroad repair shops—steam:								
Full-time earnings	947	917	937	876	1,004	1,168	1,114	1,088
Actual earnings	719	671	748	641	779	664	943	875
Agricultural implements:								
Full-time earnings	812	795	811	891	855	930	969	959
Actual earnings	558	523	594	586	615	564	745	724
Rubber goods:								
Full-time earnings	858	859	984	999	1,176	1,160	1,283	1,396
Actual earnings	591	565	721	657	845	703	986	1,054
Shipbuilding, steel:								
Full-time earnings	796	771	794	844	986	945	984	986
Actual earnings	547	507	583	555	709	573	757	745
Electrical machinery, apparatus, and supplies:								
Full-time earnings	818	793	809	776	783	856	963	991
Actual earnings	562	522	593	511	563	519	740	748

TABLE 76.—PURCHASING POWER (AT 1914 PRICES) OF ESTIMATED AMOUNTS OF ACTUAL AND FULL-TIME PER CAPITA EARNINGS, BY INDUSTRIES, FOR FEMALE WAGE EARNERS, CENSUS YEARS: 1899–1923

INDUSTRY AND TYPE OF EARNINGS	1899	1904	1909	1914	1919	1921	1923
Bread and other bakery products:							
Full-time earnings	$368	$378	$400	$364	$369	$446	$460
Actual earnings	273	311	333	278	305	339	357
Confectionery:							
Full-time earnings	372	357	367	367	365	428	463
Actual earnings	288	271	291	297	304	325	364
Mineral and soda waters:							
Full-time earnings	331	320	318	301	277	335	354
Actual earnings	280	264	263	260	246	253	337
Tobacco, cigars and cigarettes:							
Full-time earnings	401	377	375	360	340	349	373
Actual earnings	----	----	----	294	----	----	----

TABLE 76.—PURCHASING POWER (AT 1914 PRICES) OF ESTIMATED AMOUNTS OF ACTUAL AND FULL-TIME PER CAPITA EARNINGS, BY INDUSTRIES, FOR FEMALE WAGE EARNERS, CENSUS YEARS: 1899–1923—Continued

INDUSTRY AND TYPE OF EARNINGS	1899	1904	1909	1914	1919	1921	1923
Carpets and rugs, other than rag:							
Full-time earnings	$473	$449	$480	$421	$531	$642	$733
Actual earnings	392	366	413	350	428	495	631
Shirts:							
Full-time earnings	422	392	415	387	384	438	459
Actual earnings	350	319	356	322	309	338	395
Clothing, men's:							
Full-time earnings	422	418	447	416	525	577	595
Actual earnings	350	341	385	346	423	445	512
Clothing, women's:							
Full-time earnings	465	471	517	481	582	642	694
Actual earnings	385	384	445	400	468	495	598
Cotton manufactures:							
Full-time earnings	449	425	467	449	533	526	584
Actual earnings	386	358	403	388	456	438	505
Dyeing and finishing textiles, exclusive of that done in textile mills:							
Full-time earnings	454	413	433	401	448	506	536
Actual earnings	377	336	371	333	361	390	461
Knit goods:							
Full-time earnings	428	398	429	429	439	502	555
Actual earnings	355	324	369	357	353	388	478
Silk goods, including throwsters:							
Full-time earnings	468	440	482	470	517	576	647
Actual earnings	388	358	414	391	416	445	557
Woolen and worsted goods:							
Full-time earnings	457	442	464	452	534	580	649
Actual earnings	297	339	394	343	383	431	543
Boots and shoes, not including rubber boots and shoes:							
Full-time earnings	536	537	553	530	538	613	637
Actual earnings	476	460	500	444	480	492	572
Printing and publishing, book and job:							
Full-time earnings	445	446	466	459	428	567	608
Actual earnings	400	389	429	394	394	508	592
Printing and publishing, newspapers and periodicals:							
Full-time earnings	389	404	424	418	363	499	543
Actual earnings	350	352	389	359	335	447	529
Glass:							
Full-time earnings	315	323	299	300	289	326	336
Actual earnings	281	273	239	262	259	249	322
Electrical machinery, apparatus, and supplies:							
Full-time earnings	442	429	438	420	423	463	519
Actual earnings	304	282	321	276	304	281	399

REGIONAL VARIATIONS IN SELECTED INDUSTRIES

One further basis of classification is utilized in measuring these differences between the purchasing power of actual and full-time earnings, namely, industry and location. These figures for each of 24 selected industries in two leading States are presented in Table 77, the money earnings cou terpart of which has not been included in Chapter III. It is evident that the loss in purchasing power reflected by the difference between the actual and full-time deflated dollar amounts shown in Table 77 is not at all uniform for the same industry in different parts of the country. Thus, in the tobacco industry in the year 1921, when wage earners evidently received higher earnings per capita in Florida than in Pennsylvania, there was a greater loss involved, both relative and absolute, in the purchasing power of earnings in Florida than in Pennsylvania. The absolute loss, measured by the difference between the full-time and actual-time amounts

was, in Florida, 134 deflated dollars; in Pennsylvania it was 87 deflated dollars. The percentage of full-time purchasing power which was lost was 21 per cent in Florida and 18 per cent in Pennsylvania.

It is probably true, unfortunately, that in manufacturing industry generally there is not evident any consistent long-time trend toward the closing up of the gap between actual and full-time earnings by elimination of the causes for the existence of that gap, namely, unemployment and irregular employment. It is evident from the figures of Table 76, however, that in some of the industries represented, there has been appreciable improvement in this respect. Such improvement appears to have taken place in the printing and publishing industry (book and job), and in the paper and wood pulp industry. Unhappily, however, other industries such as chemicals, cotton manufactures, and woolen goods, show a tendency toward a greater loss in purchasing power attributable to lost time.

TABLE 77.—PURCHASING POWER (AT 1914 PRICES) OF ESTIMATED AMOUNTS OF ACTUAL AND FULL-TIME EARNINGS, PER CAPITA, OF MALE WAGE EARNERS, IN 2 LEADING STATES, IN EACH OF 24 SELECTED INDUSTRIES, CENSUS YEARS: 1899–1921

INDUSTRY AND STATE	CENSUS YEAR AND TYPE OF EARNINGS											
	1899		1904		1909		1914		1919		1921	
	Full-time	Actual	Full-time	Actual	Full-time	Actual	Full-time	Actual	Full-time	Actual	Full-time	Actual
Tobacco, cigars and cigarettes:												
Florida	$799	$630	$828	$676	$798	$647	$735	$587	$637	$542	$648	$514
Pennsylvania	582	482	525	452	516	440	462	389	523	469	523	436
Clothing, men's:												
New York	962	807	875	722	910	792	813	685	1,148	936	1,234	964
Illinois	862	723	948	782	868	755	936	788	1,218	993	1,417	1,107
Clothing, women's:												
New York	951	799	902	745	999	869	921	775	1,167	951	1,297	1,013
Illinois	954	800	1,182	975	1,229	1,069	1,167	983	1,304	1,063	1,410	1,101
Cotton manufactures:												
Massachusetts	642	543	602	488	644	575	605	512	681	613	702	588
North Carolina	395	286	428	305	510	384	508	370	703	495	612	414
Knit goods:												
Pennsylvania	664	557	623	514	647	563	682	574	710	579	863	674
New York	664	557	604	498	685	597	641	540	663	540	782	611
Shirts:												
New York	807	677	712	588	782	680	692	583	760	619	887	693
Pennsylvania	919	772	911	752	938	816	854	719	751	612	872	681
Silk goods, including throwsters:												
Pennsylvania	603	505	633	522	730	634	740	623	815	664	951	743
New Jersey	845	708	769	634	872	759	861	725	934	761	1,008	787
Woolen goods:												
Massachusetts	608	511	608	502	628	546	606	510	737	601	793	619
Pennsylvania	685	574	611	504	670	583	649	546	853	695	835	652
Worsted goods:												
Massachusetts	696	584	653	539	716	623	689	580	784	639	853	666
Pennsylvania	697	585	676	558	702	611	696	586	896	730	911	712
Boots and shoes, other than rubber boots and shoes:												
Massachusetts	901	757	904	746	914	795	862	726	884	720	954	745
Missouri	792	665	851	701	917	798	791	666	749	611	922	720

TABLE 77.—PURCHASING POWER (AT 1914 PRICES) OF ESTIMATED AMOUNTS OF ACTUAL AND FULL-TIME EARNINGS, PER CAPITA, OF MALE WAGE EARNERS, IN 2 LEADING STATES, IN EACH OF 24 SELECTED INDUSTRIES, CENSUS YEARS: 1899–1921—Continued

INDUSTRY AND STATE	CENSUS YEAR AND TYPE OF EARNINGS											
	1899		1904		1909		1914		1919		1921	
	Full-time	Actual	Full-time	Actual	Full-time	Actual	Full-time	Actual	Full-time	Actual	Full-time	Actual
Leather, tanned, curried, and finished:												
Massachusetts	$734	$616	$682	$563	$690	$600	$656	$552	$796	$649	$807	$630
Pennsylvania	668	559	654	540	680	592	662	557	855	697	820	640
Furniture:												
New York	841	615	814	592	847	630	798	556	823	612	980	667
Michigan	730	534	755	549	808	600	815	568	831	617	1,002	682
Lumber and timber products:												
Washington	886	755	964	814	993	857	928	753	1,015	877	828	656
Louisiana	543	435	683	543	611	498	663	505	696	566	547	407
Lumber planing-mill products, not including planing mills connected with sawmills:												
New York	854	626	876	637	910	676	865	603	849	631	1,069	728
California	949	808	1,057	893	1,149	993	1,035	839	833	720	977	774
Paper and wood pulp:												
New York	619	536	642	541	662	585	650	538	727	642	787	648
Maine	662	574	711	599	774	683	744	615	778	687	875	720
Printing and publishing, newspapers and periodicals:												
New York	1,092	947	1,106	931	1,139	1,006	1,111	919	898	793	1,252	1,030
Illinois	757	657	912	767	878	776	848	701	715	631	1,097	902
Printing and publishing, book and job:												
New York	962	834	912	767	949	838	916	758	918	811	1,201	988
Illinois	911	789	978	824	1,017	898	1,040	860	989	874	1,237	1,018
Glass:												
Pennsylvania	991	862	1,004	911	900	822	891	759	945	852	956	734
West Virginia	885	757	1,096	976	1,098	984	1,037	868	1,063	940	1,230	927
Iron and steel, blast furnaces:												
Pennsylvania	828	626	830	605	918	730	999	727	1,285	992	1,174	663
Alabama	507	385	647	475	863	692	767	563	1,055	821	1,003	572
Iron and steel, steel works and rolling mills:												
Pennsylvania	930	701	854	622	930	739	857	646	1,169	903	923	522
Ohio	989	747	992	722	1,040	826	1,004	731	1,287	993	1,010	570
Foundry and machine-shop products:												
Ohio	950	718	931	678	977	777	950	692	1,049	809	1,032	583
New York	1,059	800	995	724	1,044	830	999	727	1,020	787	1,046	591
Agricultural implements:												
Illinois	830	627	859	625	869	691	992	722	869	671	985	557
Indiana	809	611	802	584	795	632	819	596	956	738	851	481
Electrical machinery, apparatus, and supplies:												
New York	824	623	765	557	840	668	762	555	756	584	773	436
Illinois	853	643	854	622	1,034	823	1,021	743	851	658	1,128	638
Chemicals:												
New Jersey	832	726	742	673	785	717	788	671	798	720	864	663
New York	780	680	740	671	769	702	785	669	864	779	809	621

Part III

RELATIVE FLUCTUATIONS IN PER CAPITA EARNINGS

Chapter VII

RELATIVE FLUCTUATIONS IN FULL-TIME EARNINGS

Turning, now, from consideration of absolute amounts of earnings, to the present discussion of relative fluctuations in those earnings, we pass to a phase of the subject which is not only no less important than the subject of the amounts of earnings, but one which can be examined with a great deal more confidence, and the accuracy of the results of which can be depended upon much more surely than is the case, unfortunately, with the estimates of absolute amounts. This and the two following chapters are exclusively concerned with relative, or index, numbers. In other words, we are dealing with the degree and direction of the *changes* that have taken place in average earnings. The statement which was stressed in the introductory chapter should be repeated here, that the results presented in this section of the book reflect not average changes in earnings, but something quite different—changes in average earnings. For some purposes it is entirely proper to say that the changes which have taken place in industries A, B, C, and D were increases of 3 per cent, 5 per cent, 10 per cent, and 20 per cent, respectively, and to proceed to average those four percentages and say that the average change in earnings in those four industries was the average of the four percentages, or 7.6 per cent. But this is not the procedure underlying the averages used in this monograph. The operation upon which our averages are based can be illustrated by the following example: In 1899 the average earnings of wage earners in the four industries A, B, C, and D were, let us say, $500. In 1909 the average earnings of the wage earners in the same four industries were, say, $575 or a percentage change in average earnings for these industries of 11.5 per cent. To show the change that has taken place in each of the industries A, B, C, and D, by the method we have adopted, we would ascertain the average in 1899 and 1909 in each of the industries and find for each industry the ratios between the 1909 averages and the 1899 average. These ratios are the changes in average earnings for each of these industries. Of course, having ascertained these changes in each of the four industries by this method, it would be possible to strike an average from them. That result would represent an average change in earnings, which is precisely what the present index numbers are not. In other parts of this analysis it has seemed advisable, it is true, to resort to the somewhat dubious device of averag-

ing averages, but where it is done it is because of the fact that no more suitable alternative seemed to be available. With one or two exceptions, to which attention is called in the appropriate place, totals for all industries combined have never been obtained by averaging the results for the selected industries. In each case the totals for all industries, or for all regions, are based upon all of the manufacturing wage earners included in the census and are computed by finding the aggregate amounts of earnings received by particular groups at different periods and ascertaining the ratios between these amounts.

The three chapters which are devoted to relative fluctuations in per capita earnings deal, respectively, with full-time money earnings, actual money earnings, and the purchasing power of actual money earnings. This present chapter is preliminary to the more important discussion of earnings in the more accurate sense of the word, as they are reported in the two following chapters.

LIMITATIONS OF DATA ON FULL-TIME EARNINGS

Full-time earnings, as already remarked, are something of an anomaly, and, in reality, rather comparable with weekly or monthly rates of wages than with earnings. A brief presentation of the results, however, is made in this chapter in the belief that they are not entirely without importance, as some industries do rather closely approximate, in the actual earnings received by their employees, the hypothetical full-time amount which would be received if all attached to those industries worked regularly the year around. These more or less hypothetical full-time earnings, then, reflect the changes which take place in rates of pay. In other words, fluctuations in full-time earnings are fluctuations from which one of our two chief factors of influence, namely, unemployment, and changes in rates, is eliminated, the one eliminated in this case, of course, being unemployment. The result is that the changes in average earnings shown in this chapter are changes which are caused, primarily if not entirely, by revision of wage rates. The figures in this chapter reflect the direction and degree to which, assuming 100 per cent employment, annual earnings have been affected by changes in rates. It is not forgotten that there is still another factor for which discount must be made, namely, the changing level of prices, which are to be eliminated by deflating our full-time earnings to show the purchasing power. The latter figure, assuming 100 per cent employment, would then indicate the changes in the purchasing power of earnings resultant upon the single factor of changes in wage rates.

What has been said may possibly be made clearer by consulting Table 78, which is a summary of index numbers of annual earnings per capita for each year from 1899 to 1927. This present chapter deals with the sorts of fluctuations shown in the first and third columns, that

is to say, with hypothetical full-time earnings, for the most part dealing with these in the form of money earnings rather than real earnings. The following chapter has to do with such figures as those shown in the second column, and the third and last chapter deals with such figures as those shown in the last column of the table. The trend of nominal full-time earnings reflects the situation which would have prevailed had there been no unemployment—a situation which is more or less closely approximated by those industries which have succeeded in coming somewhere near to the accomplishment of full employment for all attached to industry. Such a trend, however, can not be taken as indicative of the change which has taken place in the

TABLE 78.—INDEX NUMBERS OF ESTIMATED AMOUNTS OF ANNUAL EARNINGS, PER CAPITA, IN MANUFACTURING INDUSTRIES, IN THE UNITED STATES, EACH YEAR: 1899–1927

YEAR	INDEXES OF ANNUAL EARNINGS PER CAPITA				YEAR	INDEXES OF ANNUAL EARNINGS PER CAPITA			
	Nominal (current dollars)		"Real" (purchasing power at 1914 prices)			Nominal (current dollars)		"Real" (purchasing power at 1914 prices)	
	Hypothetical full time	Actual	Hypothetical full time	Actual		Hypothetical full time	Actual	Hypothetical full time	Actual
1899	73	77	99	105	1914	100	100	100	100
1900	76	78	99	103	1915	102	106	104	108
1901	77	82	98	105	1916	118	133	110	126
1902	79	86	98	108	1917	136	149	106	116
1903	81	86	96	103	1918	179	192	114	122
1904	82	84	99	101	1919	199	210	111	118
1905	84	93	101	112	1920	239	258	117	126
1906	87	99	101	115	1921	204	182	116	102
1907	90	101	99	110	1922	198	203	119	122
1908	89	86	103	99	1923	218	229	129	146
1909	89	97	103	111	1924	217	227	128	135
1910	91	97	99	106	1925	220	243	130	143
1911	92	93	97	98	1926	224	249	130	144
1912	95	103	99	107	1927	224	238	131	140
1913	99	107	100	108					

welfare of manufacturing wage earner, even assuming that he has had full employment. Even those among the wage earners who have had full employment certainly do not have a purchasing power at their command which was three times as great in 1925 as it was in 1899. The real benefit, or burden, experienced by wage earners from year to year, as a result of changes in wage rates, will be reflected in the data only if current dollar sums have been deflated to terms of constant purchasing power. When that is done we have a series of relative amounts, such as those in the third column of Table 78. It is believed that this series represents, for all industries and regions combined, the real changes for better or for worse that could be made effective by the purchasing power of the full-time annual

earnings of manufacturing wage earners. Instead of a tripling of purchasing power, there is evident during the 29 years, an increase from an index number of 99 in 1899 to 131 in 1927, or an increase of 32 per cent. Very obviously, however, the intervening period of the quarter century was not one of slow, consistent increase; there was, in fact, no appreciable gain in purchasing power between 1900 an 1914. Since 1914 there evidently has been a considerable increase in purchasing power. This means that the actual conditions as to wage rates would have operated to bring about, on the basis of full employment, the kind and degree of change which we have just described during the period under review. Even granting this full employment, however, it should be noted that increases in wage rates were not sufficient to prevent very large, and for the wage earner no doubt disastrous, declines in purchasing power. The more outstanding examples are the declines shown between 1907 and 1908 and between 1920 and 1921. It is to be noted, on the other hand, that the last five years of our record show that, barring unemployment, changes in wage rates have tended to produce increases in purchasing power to a degree which is unprecedented during the period since 1899.

The above discussion is realistic only in very small part; that is to say, only in respect to changes in rates of wages. In other respects, and chiefly in regard to the all-important factor of unemployment and irregular employment, it is a discussion distinctly metaphysical. The figures which are given elsewhere, reflecting changes in employment and still more those reflecting estimated fractions of full employment, indicate how important—and tragic—an influence is unemployment. Consequently, it is not believed worth while to do more in this chapter than to present briefly the results which have been obtained for changes in full-time earnings.

REGIONAL VARIATIONS

A summary for the different geographic regions and divisions is given in Table 79. It is evident that, although the amounts of per capita earnings are much greater in the West and Northeast than in the South, the degree of increase in full-time money earnings, at least during the period from 1899 to 1921, has been greater in the South than in either of the other two regions of the country; the increase being about 300 per cent in the South and the corresponding increases in the Northeast and the West being 282 per cent and 250 per cent, respectively. It is to be remembered that these figures mean nothing in respect to the increase in actual money earnings and still less in regard to the increase in real earnings, but they indicate that full-time rates of wages have tended to increase in those sections of the country where they stood most in need of

increase. The degree of increase was greatest in the South, next in the North, and least of all in the West, where the amounts of full-time, as well as actual earnings, have all along been the greatest.

TABLE 79.—INDEX NUMBERS OF FULL-TIME MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, BY GEOGRAPHIC REGIONS AND DIVISIONS, CENSUS YEARS: 1899–1923

[1914=100]

REGION	1899	1904	1909	1914	1919	1921	1923
UNITED STATES	73	82	89	100	199	204	218
NORTHEAST	75	82	89	100	198	205	228
New England	79	85	92	100	194	198	214
Middle Atlantic	78	85	92	100	208	213	250
East North Central	69	79	86	100	197	204	221
West North Central	71	82	89	100	177	201	195
SOUTH	67	81	87	100	211	200	201
South Atlantic	67	79	86	100	223	205	206
East South Central	71	85	87	100	204	196	202
West South Central	66	85	86	100	187	190	181
WEST	70	87	95	100	172	180	182
Mountain	76	91	92	100	159	176	171
Pacific	68	85	95	100	176	181	185

VARIATIONS AMONG INDUSTRIES

In Table 80 are given the relatives of hypothetical full-time money earnings per capita for each of 12 selected industries in each year since 1914. These figures may have no special use other than to call attention to the wide variation even in full-time earnings between different industries and to the large fluctuations in each of these industries between successive years. A summary by industrial divisions and groups is given in Table 81, which exhibits no less wide variations in full-time money earnings than those just shown for different geographic divisions. Whereas, for all industries combined, full-time money earnings increased slightly less than threefold between 1899 and 1921, in some industries this degree of increase was much less and in others it was much greater. In the case of tobacco manufactures the increase was only a little over twofold; in iron and steel, also, the increase was less than in industry as a whole; that is to say, it was about 250 per cent. On the other hand, the rate of increase in chemicals and allied products was somewhat more than threefold, considerably above the average, and this was also true of the industry group, "Vehicles for land transportation."

The changes in full-time money earnings per capita in each of our 41 selected industries are shown for the period from 1899 to 1923 in Table 82. For "All industries" the per capita full-time money earnings of wage earners increased from an index number of 73 in 1899 to 204 in 1921 and 215 in 1923. It is clear that in the case of these selected industries there have been even wider variations than

TABLE 80.—INDEX NUMBERS OF (HYPOTHETICAL) FULL-TIME MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, ALL INDUSTRIES COMBINED, AND FOR EACH OF 12 SELECTED INDUSTRIES, EACH YEAR: 1914–1923

[Census years in bold-faced type. 1914=100]

YEAR	All industries	Woolen goods	Cotton goods	Silk goods, including throwsters	Knit goods	Clothing, men's	Boots and shoes, not including rubber boots and shoes
1914	**100**	**100**	**100**	**100**	**100**	**100**	**100**
1915	102	97	97	100	99	100	96
1916	118	120	113	112	112	112	108
1917	136	150	135	132	128	142	139
1918	179	185	194	165	164	180	185
1919	**199**	**211**	**213**	**197**	**183**	**226**	**182**
1920	239	268	260	229	217	284	206
1921	**204**	**226**	**206**	**216**	**206**	**244**	**203**
1922	198	219	196	196	202	231	196
1923	**215**	**238**	**220**	**232**	**217**	**242**	**202**

YEAR	Automobiles	Iron and steel, steel works, and rolling mills	Cars, steam-railroad, not including operations of railroad companies	Paper and wood pulp	Tobacco, cigars and cigarettes	Leather, tanned, curried, and finished
1914	**100**	**100**	**100**	**100**	**100**	**100**
1915	----------	95	97	94	96	98
1916	----------	124	96	107	117	117
1917	109	148	133	120	142	126
1918	128	186	174	154	161	171
1919	**176**	**225**	**196**	**198**	**169**	**214**
1920	205	261	237	250	208	236
1921	**184**	**183**	**197**	**201**	**170**	**208**
1921	199	177	171	198	167	208
1923	**200**	**218**	**211**	**208**	**173**	**222**

TABLE 81.—INDEX NUMBERS OF FULL-TIME MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, BY INDUSTRIAL DIVISIONS AND GROUPS, CENSUS YEARS: 1899–1923

[1914=100]

INDUSTRY GROUP	1899	1904	1909	1914	1919	1921	1923
All groups	73	82	89	**100**	199	204	218
I.—Food, drink, and tobacco	76	84	91	100	183	199	197
Food and kindred products	74	83	91	100	188	209	206
Liquors and beverages	77	84	88	100	152	175	164
Tobacco manufactures	83	90	96	100	181	185	186
II.—Textiles, garments, and leather	82	90	100	100	221	235	243
Textiles and products	74	81	92	100	205	217	225
Leather and its finished products	74	83	91	100	188	203	204
III.—Lumber and its products[1]	71	86	88	100	191	185	200
IV.—Paper and printing[2]	72	81	89	100	169	208	215
V.—Stone, clay, glass, and chemicals	72	50	89	100	193	207	216
Chemicals and allied products	71	81	86	100	207	218	222
Stone, clay, and glass products	72	85	90	100	179	198	210
VI.—Metals, metal products, miscellaneous	68	74	81	100	179	180	193
Iron and steel and their products	76	82	91	100	203	188	215
Metals and metal products, other than iron and steel	80	87	92	100	182	188	205
Vehicles for land transportation	63	71	80	100	186	196	213
Railroad repair shops	80	87	93	100	204	232	212
Miscellaneous industries	75	81	89	100	205	204	212

[1] Same as the census group "Lumber and its remanufactures."
[2] Same as the census group under the same title.

are shown in the larger and more inclusive groups of industries, which are made up of consolidations of the selected industries and a very much larger number of less important industries in cognate groups.

TABLE 82.—INDEX NUMBERS OF FULL-TIME MONEY EARNINGS, PER CAPITA, BY SELECTED INDUSTRIES, FOR ALL SEX AND AGE GROUPS COMBINED, CENSUS YEARS: 1899–1923

INDUSTRY	1899	1904	1909	1914	1919	1921	1923
All industries	73	82	89	100	199	204	218
Bread and other bakery products	75	86	96	100	181	216	213
Flour-mill and gristmill products	81	82	88	100	180	197	189
Confectionery	75	81	87	100	178	206	215
Slaughtering and meat packing	78	86	91	100	206	207	201
Liquors, malt	76	84	88	100	154	185	179
Mineral and soda waters	81	88	92	100	165	196	198
Tobacco, cigars and cigarettes	83	87	90	100	169	170	173
Carpets and rugs, other than rag	83	88	99	100	226	268	293
Shirts	81	84	93	100	177	199	200
Clothing, men's	75	83	93	100	226	244	242
Clothing, women's	72	81	93	100	216	235	243
Cotton manufactures	74	79	91	100	213	206	220
Dyeing and finishing textiles, exclusive of that done in textile mills	84	85	94	100	200	222	223
Knit goods	74	77	87	100	183	206	217
Silk goods, including throwsters	74	78	89	100	197	216	232
Woolen and worsted goods	75	81	89	100	211	226	238
Boots and shoes, not including rubber boots and shoes	75	84	91	100	182	203	202
Leather, tanned, curried, and finished	76	83	91	100	214	208	222
Furniture	73	81	90	100	181	206	216
Lumber and timber products	72	91	87	100	205	173	192
Lumber, planing-mill products, not including planing mills connected with sawmills	69	81	89	100	164	191	200
Paper and wood pulp	69	81	89	100	198	201	208
Printing and publishing, book and job	72	81	89	100	167	218	223
Printing and publishing, newspapers and periodicals	69	80	88	100	155	210	244
Chemicals	----	80	87	100	192	184	195
Petroleum refining	72	78	92	100	199	213	203
Brick and tile, terra-cotta, and fire-clay products	66	81	90	100	183	199	217
Glass	78	89	87	100	172	191	188
Iron and steel, blast furnaces	61	70	83	100	229	203	208
Iron and steel, steel works and rolling mills	73	78	90	100	225	183	218
Foundry and machine-shop products	77	85	92	100	192	191	212
Smelting and refining, copper, lead, and zinc	78	89	93	100	168	157	175
Automobile bodies and parts	----	74	87	100	184	192	211
Automobiles	70	72	77	100	176	184	200
Cars, steam-railroad, not including operations of railroad companies	66	78	82	100	196	197	211
Railroad repair shops—electric	88	90	91	100	177	204	199
Railroad repair shops—steam	80	87	93	100	205	235	215
Agricultural implements	67	74	79	100	172	184	184
Rubber goods	64	71	85	100	210	204	213
Shipbuilding, steel	70	76	82	100	209	197	197
Electrical machinery, apparatus, and supplies	78	85	91	100	181	194	207

The unreality of figures which ignore unemployment is very strikingly indicated here, since on the face of these data earnings appear to have been higher in 1921 than in 1919. This necessitates reemphasis on the fact that these full-time earnings are what might be more accurately described as "annual rates of pay." What is brought out by the figures is that in most of these industries *rates* either did not

suffer a net decline, or continued to advance, through at least the first part of the period from 1919 to 1921. The figures already given for 12 selected industries for each year indicate that most of this gain took place not in the period of depression, but in practically all of the industries, between the year 1919 and the peak year of prosperity, 1920. In every one of the 12 industries shown in Table 80 as a matter of fact, even rates decreased between 1920 and 1921, so that in Table 82 the apparent increase in rates between 1919 and 1921 is something of an illusion and reflects increases in rates which took place in the intercensal year 1920.

Some notion of the differences which have prevailed in the trend of wages in identical industries in different parts of the country may be had from the figures of Table 83, which gives for two leading States the relatives of full-time money earnings per capita in each of the 24 selected industries. The only purpose that is served by the figures of Table 83 is to indicate that even within the same industry changes in rates have differed from one State to another. Thus in men's clothing it would appear that there has been a greater increase in full-time earnings in Illinois than in New York. Similarly, there appears to have been a greater increase in full-time earnings in cotton manufactures in North Carolina than in Massachusetts; a greater increase in silk goods in Pennsylvania than in New Jersey; a greater increase in the furniture industry in Michigan than in New York; a greater increase in newspaper printing and publishing in Illinois than in New York; a much greater increase in the glass industry in West Virginia than in Pennsylvania; a considerably greater increase in rates in the electrical machinery, apparatus, and supplies industry in Illinois than in New York.

TABLE 83.—INDEX NUMBERS OF FULL-TIME MONEY EARNINGS (MALE WAGE EARNERS) IN 24 SELECTED INDUSTRIES, IN SELECTED STATES: 1899–1921

[1904=100]

INDUSTRY AND STATE	1899	1904	1909	1914	1919	1921
Tobacco, cigars and cigarettes:						
Florida	86	100	101	107	166	166
Pennsylvania	99	100	103	106	215	211
Clothing, men's:						
New York	98	100	109	112	283	299
Illinois	81	100	96	119	277	317
Clothing, women's:						
New York	94	100	116	123	279	305
Illinois	72	100	109	119	238	253
Cotton manufactures:						
Massachusetts	95	100	112	121	244	247
North Carolina	82	100	125	143	354	303
Knit goods:						
Pennsylvania	95	100	109	132	246	294
New York	98	100	119	128	237	275
Shirts:						
New York	101	100	115	117	230	264
Pennsylvania	90	100	108	113	178	203
Silk goods:						
Pennsylvania	85	100	121	141	278	319
New Jersey	98	100	119	135	262	278

TABLE 83.—INDEX NUMBERS OF FULL-TIME MONEY EARNINGS (MALE WAGE EARNERS) IN 24 SELECTED INDUSTRIES, IN SELECTED STATES: 1899–1921—Continued

[1904=100]

INDUSTRY AND STATE	1899	1904	1909	1914	1919	1921
Woolen goods:						
Massachusetts	89	100	108	120	261	276
Pennsylvania	100	100	115	128	301	290
Worsted goods:						
Massachusetts	95	100	115	127	259	277
Pennsylvania	92	100	109	124	286	286
Boots and shoes, not including rubber boots and shoes:						
Massachusetts	89	100	106	115	211	224
Missouri	83	100	113	112	190	230
Leather, tanned, curried, and finished:						
Massachusetts	96	100	106	116	252	251
Pennsylvania	91	100	109	122	232	266
Furniture:						
New York	92	100	109	118	218	255
Michigan	86	100	112	130	237	281
Lumber and timber products:						
Washington	82	100	108	116	227	182
Louisiana	71	100	94	117	220	170
Lumber, planing-mill products, not including planing mills connected with sawmills:						
New York	87	100	109	119	209	259
California	80	100	114	118	170	196
Paper and wood pulp:						
New York	86	100	118	122	244	260
Maine	83	100	114	126	236	261
Printing and publishing, newspapers and periodicals:						
New York	88	100	108	121	175	240
Illinois	74	100	101	112	169	255
Printing and publishing, book and job:						
New York	94	100	109	121	217	279
Illinois	83	100	109	128	218	268
Glass:						
Pennsylvania	88	100	94	107	203	202
West Virginia	72	100	105	114	209	238
Iron and steel, blast furnaces:						
Pennsylvania	89	100	116	145	334	300
Alabama	70	100	140	143	352	329
Iron and steel, steel works and rolling mills:						
Pennsylvania	97	100	114	125	295	229
Ohio	89	100	110	122	280	216
Foundry and machine-shop products:						
Ohio	91	100	110	123	243	235
New York	95	100	110	121	221	223
Agricultural implements:						
Illinois	86	100	106	139	218	243
Indiana	90	100	104	123	257	225
Electrical machinery, apparatus, and supplies:						
New York	96	100	115	120	213	214
Illinois	89	100	127	144	215	280
Chemicals:						
New Jersey	100	100	111	128	232	247
New York	94	100	109	128	252	232

The differences which have just been discussed, it must be remembered, are of distinctly secondary importance, the fundamentally significant matters are the amounts of earnings proper; that is to say, the amounts of earnings actually received and, what we are concerned with in this part of the analysis, the changes in those average amounts. To that central aspect of the subject we now turn.

Chapter VIII

CHANGES IN PER CAPITA MONEY EARNINGS

This chapter and the following one deal with changes in earnings in the proper and important sense of the word earnings. They are concerned, that is to say, with index numbers which represent changes which have taken place in the amounts of earnings estimated to have been actually received, taking into account the amount of time lost out of full time by unemployment, underemployment, irregular employment, etc., as accurately as it has been possible to determine those factors. In making this unemployment discount, by multiplying full-time earnings by the ratios of actual to full employment, described in Chapters XV and XVI, we have intended to take into account not only the unemployment of those on pay rolls, but also the unemployment experienced by those workers in manufacturing industry who were completely out of employment, and who yet remained attached to their respective industries; that is to say, the result of our discount produces an estimated amount of actual earnings *per capita of wage earners attached to industry* and the index numbers presented are index numbers of changes in the earnings of all those attached to manufacturing industry. In this chapter the index numbers presented are for per capita money earnings; in the following chapter are given the deflated relatives indicating changes in real earnings, per capita, of wage earners attached to industry.

By means of the method of interpolation of intercensal years, elsewhere described, it has been possible to construct annual indices of per capita money earnings for manufacturing industries. This series of relatives on the 1914 base is presented in Table 84. The

Table 84.—Index Numbers of Actual Annual Money Earnings, Per Capita, in the United States, All Industries Combined, Each Year: 1899–1927

[Census years in bold-faced type. 1914=100]

Year	Index of money earnings	Year	Index of money earnings	Year	Index of money earnings	Year	Index of money earnings
1899	77	1907	101	**1914**	**100**	**1921**	182
1900	78	1908	86	1915	106	1922	203
1901	82	**1909**	97	1916	133	**1923**	229
1902	86	1910	97	1917	149	1924	227
1903	86	1911	93	1918	192	**1925**	243
1904	84	1912	103	**1919**	210	1926	249
1905	93	1913	107	1920	258	1927	238
1906	99						

figures show that, since the first of this century, money earnings have increased about threefold, the greater part of that increase having taken place since the opening of the Great War in Europe. The trend between 1899 and 1927 while predominantly upward, has been by no means uniformly so. There are one or two marked drops in earnings reflected in the figures, the more important of which are the declines which took place between 1907 and 1909 and between 1920 and 1921. These declines, it should be remembered, are the result chiefly of unemployment and irregular employment; that is to say, the trend in rates throughout the period has been practically an unbroken rise during the quarter century, as was explained in the preceding chapter.

REGIONAL FLUCTUATIONS

A summary for census years of the relative fluctuations in per capita money earnings for different parts of the country is given in Table 85, in which earnings are classified by geographic regions and divisions. It will be remembered that the *amounts* of per capita earnings were highest in the West, next highest in the Northeast, and lowest in the southern region of the country. Table 85 indicates

TABLE 85.—INDEX NUMBERS OF MONEY EARNINGS, PER CAPITA, BY GEOGRAPHIC REGIONS AND DIVISIONS, ALL INDUSTRIES COMBINED, CENSUS YEARS: 1899–1923

REGION	1899	1904	1909	1914	1919	1921	1923
UNITED STATES	77	84	97	100	210	182	229
NORTHEAST	77	83	96	100	232	176	240
New England	81	87	99	100	227	170	225
Middle Atlantic	80	86	99	100	243	183	263
East North Central	71	81	92	100	230	175	232
West North Central	73	83	95	100	207	172	205
SOUTH	71	83	94	100	223	179	227
South Atlantic	71	80	93	100	235	183	232
East South Central	75	87	94	100	216	175	228
West South Central	72	87	93	100	197	169	204
WEST	75	89	102	100	182	161	205
Mountain	81	93	99	100	168	158	193
Pacific	72	87	106	100	186	162	210

that the relationship between the three regions in respect to *changes* in average earnings is very different. In the South, where amounts of earnings have been lowest, and in the Northeast, which occupies a middle position in respect to amounts of earnings, manufacturing labor incomes have shown, through the 25-year period, much greater increases in earnings than has the West. In the West, where amounts of earnings were highest of all the three regions, the rate of increase appears to have been least, falling far behind the South and Northeast. There are evident wide differences within each of the three regions, but these differences are not so great but that we can rely pretty

confidently on the index numbers for the three regions among which the nine divisions are distributed. Of the nine geographic divisions, the one which has witnessed the greatest increase in money earnings, per capita, appears to have been the Middle Atlantic, while the one which has experienced the least rapid increase is the Mountain division.

The figures in Table 85 present interesting differences between different geographic regions in respect to the extent of the fall in money earnings between 1919 and 1921. The greatest decline, as might be expected, occurred in the two most highly industrialized regions—the New England and Middle Atlantic divisions, where the decline was in each case about 25 per cent. The smallest decline was in the Mountain division, where earnings per capita in 1921 were only 6 per cent less than in 1919. The caution is due in this connection that apparent declines from 1919 to 1921 may be misleading because of the fact that the year 1920, which was for most industries the peak year of prosperity, intervenes between the two census years 1919 and 1921. This, of course, means that the maximum decline from the peak of prosperity to the bottom of the depression was considerably greater than 25 per cent and probably came close to 35 per cent.

Difficulties of this kind are much less serious in the biennial period 1921–1923, since no peak occurred in 1922. For the country as a whole and for most of the separate geographic divisions there was a larger gain in money earnings between 1921 and 1923 than there was (net) loss between 1919 and 1921. But the gain in the later period did *not* bring money earnings back to a point as high as the 1920 level, which our interpolations put at 258, as indicated in Table 84. Index numbers of money earnings in 1920 are not available for the separate regions, but so far as one may judge from the figures which we have, it seems scarcely likely that in any of the geographic divisions the 1921–1923 gain could have been as great as the 1920–1921 loss.[1] Moreover, it will be noticed that in three of the nine geographic divisions, namely, the New England, West North Central, and South Atlantic divisions, money earnings in 1923 had not climbed back even to the 1919 level—a level considerably lower than that of 1920.

Figures showing relative amounts of per capita money earnings in each State for each manufactures census year are given in Table 86. As would be expected, these figures show that even within the geographic divisions there are considerable differences in the trend of money earnings since the beginning of the century. The State showing the maximum increase between 1899 and 1923 was North Carolina, where money earnings increased 302 per cent between 1899 and

[1] It is evident, however, that, in several of the industries, the 1921–1923 gain in money earnings was greater than the 1920–1921 loss.

1923. Half of this increase took place between 1914 and 1919, in which 5-year period per capita money earnings increased 154 per cent. Michigan is a close second with an increase during the 25-year period of 292 per cent, of which 135 per cent occurred between 1914 and

TABLE 86.—INDEX NUMBERS OF MONEY EARNINGS, PER CAPITA, ALL INDUSTRIES COMBINED, BY STATES, CENSUS YEARS: 1899–1923

STATE	1899	1904	1909	1914	1919	1921	1923
United States	77	84	97	100	210	182	229
Maine	71	84	96	100	236	180	220
New Hampshire	76	84	96	100	218	169	216
Vermont	73	82	96	100	210	165	209
Massachusetts	82	86	98	100	224	170	224
Rhode Island	80	86	100	100	220	174	228
Connecticut	86	89	101	100	235	164	228
New York	79	85	100	100	232	187	243
New Jersey	82	87	99	100	246	185	254
Pennsylvania	81	86	98	100	255	176	242
Ohio	73	82	95	100	243	176	237
Indiana	72	79	91	100	222	174	224
Illinois	73	83	94	100	214	176	224
Michigan	61	70	82	100	235	176	238
Wisconsin	72	83	96	100	223	167	219
Minnesota	73	83	96	100	204	171	202
Iowa	66	75	90	100	207	171	201
Missouri	76	87	97	100	202	172	208
North Dakota	68	81	93	100	190	175	205
South Dakota	75	83	98	100	208	169	182
Nebraska	72	82	91	100	219	173	198
Kansas	77	86	100	100	223	181	211
Delaware	82	87	102	100	292	185	243
Maryland	73	81	93	100	254	183	230
District of Columbia	76	87	102	100	186	195	247
Virginia	74	82	90	100	244	197	244
West Virginia	65	80	91	100	210	188	235
North Carolina	62	76	91	100	254	185	248
South Carolina	61	71	89	100	247	178	223
Georgia	69	83	99	100	237	174	207
Florida	73	86	97	100	215	161	204
Kentucky	76	85	93	100	206	192	246
Tennessee	76	87	93	100	203	175	220
Alabama	69	84	95	100	227	168	228
Mississippi	76	95	98	100	229	155	202
Arkansas	69	91	94	100	203	151	195
Louisiana	75	91	94	100	200	159	195
Oklahoma	63	83	94	100	198	188	232
Texas	78	85	97	100	191	175	205
Montana	85	104	107	100	161	140	183
Idaho	66	82	86	100	167	149	188
Wyoming	80	91	102	100	231	222	244
Colorado	86	96	103	100	174	169	198
New Mexico	72	89	95	100	173	137	189
Arizona	86	94	102	100	241	141	175
Utah	69	84	98	100	153	158	180
Nevada	76	91	98	100	150	153	193
Washington	75	89	101	100	202	149	206
Oregon	69	87	103	100	202	152	204
California	72	87	103	100	174	169	213

1919. Other States showing unusually large increases in earnings between 1899 and 1923 are Maryland, Delaware, Virginia, and Kentucky. At the other end of the scale, the State of Arizona appears to be the one where per capita earnings increased least of all during the quarter century, the per cent of increase being 103. The rate of

increase was also relatively low in Montana, Colorado, South Dakota, Nevada, and Utah. Delaware seems to have the distinction not only of having experienced the greatest increase in per capita earnings between 1899 and 1919, but also to be the State wherein earnings experienced the most headlong drop between 1919 and 1921. The decline in that State between those two years was 37 per cent.

CHANGES IN EARNINGS IN LEADING CITIES

Since manufacturing is so very largely an urban activity, it seems very desirable to present such data as are available for the larger cities. Because of the fact that the special investigation into the earnings of wage earners made by the Census Bureau in 1904 did not report average weekly earnings by cities and because our estimates of the amounts of earnings have had their starting point in the results of the 1904 investigation, it has not been feasible to report amounts of earnings by cities. It is possible, however, to present index numbers of per capita earnings for 18 of the largest cities in the United States. In Table 87 indexes of per capita earn-

TABLE 87.—INDEX NUMBERS OF PER CAPITA MONEY EARNINGS, OF MANUFACTURING WAGE EARNERS, BY CITIES, CENSUS YEARS: 1899–1923

[1914=100]

CITY	1899	1904	1909	1914	1919	1921	1923
United States	77	84	97	100	210	182	229
Baltimore	74	82	97	100	256	186	227
Boston	87	87	97	100	202	168	219
Buffalo	72	79	93	100	230	174	226
Chicago	73	84	93	100	216	181	228
Cincinnati	78	85	100	100	208	181	227
Cleveland	74	81	93	100	240	169	233
Detroit	58	68	81	100	247	195	251
Los Angeles	69	90	102	100	161	160	212
Minneapolis	73	80	93	100	190	162	194
New York	85	88	103	100	242	200	253
Oakland	67	82	107	100	186	164	206
Philadelphia	82	86	97	100	247	187	248
Pittsburgh	83	87	97	100	239	172	234
San Francisco	71	84	107	100	164	162	200
St. Louis	77	87	100	100	195	169	208
St. Paul	63	77	92	100	192	176	204
Seattle	81	87	100	100	206	156	200
New Orleans	83	88	103	100	199	174	200

ings are reported for these cities. In the 18 cities are employed a little more than one-fourth of the manufacturing wage earners of the country. The list includes the 10 cities having the greatest value-product in the year 1919; they have also been chosen, so far as is possible in so short a list, with an eye to having all parts of the country fairly well represented.

The maximum increase in money earnings between 1899 and 1923 appears to have taken place in the city of Detroit, where it has

amounted to 332 per cent. It is to be noticed, however, that per capita earnings in Detroit in 1899 were, relative to 1914, much lower than in most of the cities, lower indeed than in any of the other cities listed. The lowest increase in money earnings per capita appears to have been in New Orleans, where they rose only about 141 per cent.

The greatest decline in earnings between 1919 and 1921 appears to have taken place in Baltimore, where the fall was about 27 per cent. Philadelphia, Detroit, and New York also witnessed rather heavier declines than did the country as a whole. The least decline between 1919 and 1921 appears to have been experienced in Los Angeles, where the fall was less than 1 per cent.

COMPARISON OF FLUCTUATIONS IN DIFFERENT INDUSTRIES

More significant, probably, than classification by geographic regions or by cities, is that which follows lines of industrial division. Table 88 gives a summary classification which includes all manufacturing industries arranged in 14 groups of industries as classified by the census and these in turn grouped into 6 industrial divisions. The table also gives the index numbers for all of these groups and divisions combined. Naturally, the fluctuations shown in these relatively large groupings, in even the smallest of which are included a fairly large number of separate industries, are less wide than for separate industries, a selected number of which are reported a little

TABLE 88.—INDEX NUMBERS OF MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, BY INDUSTRIAL GROUPS AND DIVISIONS, CENSUS YEARS: 1899–1923

[1914=100]

INDUSTRY GROUP AND DIVISION	1899	1904	1909	1914	1919	1921	1923
All groups	77	84	97	100	210	182	229
I.—Food, drink, and tobacco	75	86	92	100	196	197	209
Food and kindred products	73	85	92	100	201	207	218
Liquors and beverages	76	86	89	100	163	173	174
Tobacco manufactures	82	92	97	100	194	183	197
II.—Textiles, garments, and leather	82	88	103	100	214	219	250
Textiles and products	74	79	95	100	199	202	232
Leather and its finished products	74	81	94	100	182	189	210
III.—Lumber and its products	75	89	94	100	204	181	244
IV.—Paper and printing	76	83	95	100	181	208	271
V.—Stone, clay, glass, and chemicals	73	53	95	100	205	186	244
Chemicals and allied products	72	86	92	100	219	196	251
Stone, clay, and glass products	73	90	96	100	190	178	237
VI.—Metals, metal products, and miscellaneous	71	74	88	100	190	140	224
Iron and steel and their products	79	82	99	100	215	147	249
Metals and metal products, other than iron and steel	83	87	100	100	193	147	238
Vehicles for land transportation	66	71	87	100	197	153	247
Railroad repair shops	83	87	101	100	216	181	246
Miscellaneous industries	78	81	97	100	217	159	246

further on in this chapter. This is due, of course, to the fact that the extreme fluctuations which characterize certain industries are canceled out when those industries are consolidated with cognate industries in which the fluctuations have taken place within narrower limits.

Despite the blurring resultant upon such consolidation it is evident from Table 88 that there are clearly marked differences between the different industrial groups as to the changes which have taken place in per capita earnings since 1899. Among the six large industrial divisions, the largest increase between 1899 and 1923 appears to have been attained by the stone, clay, glass, and chemicals division, where the increase was about 235 per cent; next in rank was the textile, garment, and leather group, where the increase was about 205 per cent. The textile, garment, and leather group is not the only division, moreover, wherein there appears to have been not a fall but an increase in money earnings as between 1919 and 1921; it was true also of food, drink, and tobacco; and paper and printing; in the former group the increase was less than 1 per cent, in paper and printing it was about 15 per cent. More than balancing these cases of increased earnings between 1919 and 1921 were the three other groups which showed considerable declines in earnings. Lumber and timber products dropped from 204 to 181; stone, clay, glass, and chemicals went from 205 to 186; metals, metal products, and miscellaneous from 190 to 140, the result, of course, being reflected in figures for all groups combined, which show a considerable drop between 1919 and 1921. Even the three divisions in which there seems to have been increases in earnings between 1919 and 1921 are probably misleading, and if the index numbers for 1920 were available, it would undoubtedly be shown that in few, if any cases, was there a rise between 1920, the peak year, and the following year, 1921. There certainly is none shown among the 12 selected industries reported in Table 92.

Among the six industrial divisions the increases range from one of 180 per cent in the case of food, drink, and tobacco, to one of 257 per cent in the case of paper and printing. A closer approach is made to the fluctuations in individual industries in the index numbers for the 14 groups of industries which make up the six divisions just discussed. In the case of these groups there is apparently much less uniformity than appears to prevail among the grand divisions. The greatest increase occurs in the manufacture of vehicles for land transportation, a rise of 275 per cent. The minimum increase was in liquors and beverages—128 per cent.

The relative amounts of per capita money earnings in each of the 41 selected industries are shown in Table 89, where we undoubtedly get the most faithful reflection of differences in income fluctuations

of money earnings as between different industries. The range of variation among the different industries is quite evidently much greater than in the preceding table based upon a group and division classification. Here we note uncommonly high rates of increase such as that experienced in the blast-furnace branch of the iron and steel industry, where the index numbers are 70 and 261 for 1899 and 1919, respectively. Other industries to be credited with especially large

TABLE 89.—INDEX NUMBERS OF MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, BY SELECTED INDUSTRIES, CENSUS YEARS: 1899–1923

INDUSTRY	1899	1904	1909	1914	1919	1921	1923
All industries	77	84	97	100	210	182	229
Bread and other bakery products	73	93	104	100	196	214	217
Flour-mill and gristmill products	79	88	95	100	195	195	195
Confectionery	72	75	85	100	183	193	210
Slaughtering and meat packing	80	94	96	100	242	208	235
Liquors, malt	75	86	88	100	157	161	197
Mineral and soda waters	80	91	88	100	169	171	219
Tobacco, cigars and cigarettes	83	88	91	100	171	170	178
Carpets and rugs	83	87	103	100	218	249	305
Shirts	80	82	96	100	171	185	207
Clothing, men's	75	82	96	100	219	227	249
Clothing, women's	71	80	97	100	209	218	252
Cotton manufactures	74	76	91	100	210	198	220
Dyeing and finishing textiles	84	84	97	100	193	206	234
Knit goods	73	75	99	100	177	191	226
Silk goods	73	76	92	100	190	200	242
Woolen and worsted goods	64	82	100	100	200	221	268
Boots and shoes	79	86	98	100	193	195	217
Leather, tanned, curried, and finished	80	85	98	100	230	196	282
Furniture	76	84	96	100	194	201	262
Lumber, timber products	76	95	93	100	218	169	235
Lumber, planing-mill products	72	84	95	100	174	187	242
Paper and wood pulp	73	82	95	100	209	189	238
Printing and publishing, book and job	75	82	95	100	179	227	256
Printing and publishing, newspapers, etc	72	81	94	100	167	219	250
Chemicals		83	88	100	196	160	212
Petroleum refining	88	78	89	100	196	179	215
Brick and tile, pottery, terra-cotta, and fire-clay products	65	88	102	100	210	195	266
Glass	79	87	79	100	177	167	205
Iron and steel, blast furnaces	70	75	97	100	261	170	260
Iron and steel, steel works and rolling mills	85	83	105	100	257	153	272
Foundry and machine-shop products	88	89	105	100	215	164	256
Smelting and refining, copper, lead, and zinc	82	93	100	100	175	120	202
Automobile bodies and parts		70	89	100	182	138	226
Automobiles	69	68	79	100	173	133	216
Cars, steam-railroad	68	73	80	100	221	162	259
Railroad repair shops—electric	92	90	99	100	187	158	231
Railroad repair shops—steam	83	87	102	100	217	182	248
Agricultural implements	70	74	88	100	188	169	212
Rubber goods	67	71	95	100	230	188	254
Shipbuilding, steel	73	76	91	100	229	182	231
Electrical machinery, apparatus, and supplies	81	85	101	100	197	179	244

increases during the period from 1899 to 1921 were slaughtering and meat packing; leather, tanned, curried, and finished; iron and steel, steel works and rolling mills; cars, steam-railroad; and rubber goods. Among industries at the other end of the scale, showing relatively small increases in earnings, were liquors, malt; mineral and soda waters; shirts; printing and publishing, newspapers and periodicals; glass; and electric-railroad repair shops.

In order to set forth more clearly the differences between industries in regard to relative fluctuations in money earnings, a summary has been made in Table 90 in which the 41 industries are arranged in each census year according to the relative money earnings paid in the industry. There is evident here, as was explained in connection with an earlier table presenting the amounts of earnings, the same marked division of the whole period into two fields of concentration, one including the period prior to 1914 and the other including the last three census years shown in the table. The first period is marked by relatively low money earnings, the second and more recent one, by very much higher money earnings. The second period is also in contrast with the first in respect to the wider range of variation between industries. There seems to be a much more definite concentration in the earlier than in the later period. Thus, in 1899,

TABLE 90.—FORTY-ONE SELECTED INDUSTRIES, ARRANGED ACCORDING TO RELATIVES OF ANNUAL MONEY EARNINGS, PER CAPITA, CENSUS YEARS: 1899–1923

[1914=100]

RELATIVE MONEY EARNINGS	NUMBER OF INDUSTRIES			RELATIVE MONEY EARNINGS	NUMBER OF INDUSTRIES			RELATIVE MONEY EARNINGS	NUMBER OF INDUSTRIES			RELATIVE MONEY EARNINGS	NUMBER OF INDUSTRIES		
	1899[1]	1904	1909		1919	1921	1923		1919	1921	1923		1919	1921	1923
60–64	1			115–119				170–174	4	3		225–229	1	2	2
65–69	4	1		120–124		1		175–179	4	2	1	230–234	2		3
70–74	12	4		125–129				180–184	2	2		235–239			3
75–79	8	7	2	130–134		1		185–189	2	4		240–244	1		3
80–84	10	12	1	135–139		1		190–194	4	2		245–249		1	2
85–89	3	11	7	140–144				195–199	5	5	2	250–254			3
90–94	1	5	7	145–149				200–204	1	2	1	255–259	1		3
95–99		1	15	150–154		1		205–209	2	2	2	260–264	1		2
100–104			7	155–159	1	1		210–214	2	1	3	265–269			2
105–109			2	160–164		4		215–219	5	2	5	270–274			1
110–114				165–169	2	3		220–224	1	1	1	275–305			2

[1] 39 industries.

out of 39 industries 12 had per capita earnings ranging between 70 and 74 as compared with 100 for 1914; 10 had per capita money earnings ranging between 80 and 84. In 1904, 12 out of 41 industries had per capita money earnings ranging between 80 and 84, and in 1909, 15, or more than one-third of the industries, had per capita earnings ranging between 95 and 99 as compared with 100 for 1914. For the whole of this earlier period, including the three manufactures census years shown, the relatives ranged between the industry which reported the minimum per capita earnings, which fell between 60 and 64, and the two industries which reported the maximum per capita earnings which fell between 100 and 105. In the later period there is no case where more than five industries fell in the same earnings class and there are only three cases where as many as five industries fell in the same earnings class. Moreover the range between maximum and minimum is very much wider than in the

earlier period. In 1919 the range was between 155 and 260, with 1914 as 100; in 1921, the range was between 120 and 245 on the same base.

PERCENTILE DISTRIBUTION OF THE 41 INDUSTRIES

A more condensed representation of the same facts is contained in Table 91, which shows the median, decil, and extreme industry relatives of annual money earnings per capita for each manufactures census year. The items in this table represent, not the number of industries, but the relative amounts of per capita earnings as compared with 1914, in the industry which occupied the median, or middle, position among the 41 industries in respect to relative earnings; in the industries which occupied the extreme positions (that is, the industry having the very lowest, and the one having the very highest, earnings), and similarly the relative numbers representing

TABLE 91.—MEDIAN, DECIL, AND EXTREME INDUSTRY RELATIVES OF ANNUAL MONEY EARNINGS, PER CAPITA, CENSUS YEARS: 1899–1923

[1914=100]

	1899 [1]	1904	1909	1914	1919	1921	1923
Maximum relative	92	95	105	100	261	249	305
Ninth decil	84	91	102	100	230	219	266
Eighth decil	82	88	100	100	218	206	256
Seventh decil	80	87	97	100	210	196	250
Sixth decil	79	85	96	100	200	193	242
Median	75	83	95	100	196	187	235
Fourth decil	73	82	93	100	190	179	226
Third decil	73	78	91	100	182	169	217
Second decil	71	75	88	100	175	162	212
First decil	68	73	85	100	171	153	202
Minimum relative	64	68	79	100	157	120	178

[1] Only 39 industries used in 1899. "Automobiles, bodies and parts," and "Chemicals" not included.

the per capita earnings of industries occupying positions between the median and high and low extremes, positions, to be more precise, which separate the whole number of industries into 10 equal parts. Thus, taking the year 1921 for illustration, the data of Table 91 are to be interpreted after this fashion: Half of the 41 industries had relative earnings, the amounts of which were between 187 and 249, as compared with 100 for 1914; another one-half earnings the relative amounts of which were between 120 and 187, as compared with 100 for 1914; the median relative of per capita earnings was 187. In one-tenth of the 41 industries the relative per capita earnings, as compared with 1914 as 100, were between 187 and 193; in another one-tenth between 193 and 196; and the highest one-tenth of the industries had relative earnings between 219 and 249. The lowest one-tenth of the industries, on the other hand, had per capita earnings falling between 120 and 153. The general degree of concentration,

and the variation in the degree of concentration between different census years, is more clearly brought out in Figure 15 (on p. 119 above), based on the absolute dollar figures of Table 49. The lines of the chart bring out still more clearly the fact mentioned in an earlier chapter, that there has been a much greater degree of concentration around the typical, or median, industry in the first half of the 25-year period than in the last half, the difference being represented in Table 91 by the relative distances between the minimum of 64 and the maximum of 92 in 1899, and the minimum of 178 and the maximum of 305 in 1923.

An annual series of index numbers of per capita money earnings for 12 industries is presented in Table 92. These relatives, being continuous, have the advantage of showing the changes which took place in intercensal years and help to correct the figures given in preceding tables for census years only. It is evident that every one of the 12 industries had a decline in money earnings between

TABLE 92.—INDEX NUMBERS OF ACTUAL ANNUAL MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, FOR EACH OF 12 SELECTED INDUSTRIES: 1899–1927

[Census years in bold-faced type. 1914=100]

YEAR	Woolen goods	Cotton manufactures	Silk goods, including throwsters	Knit goods	Clothing, men's	Boots and shoes [1]	Automobiles	Iron and steel, steel works and rolling mills	Cars, steam-railroad [2]	Paper and wood pulp	Tobacco, cigars and cigarettes	Leather, tanned, curried, and finished
1899	64	74	73	73	75	79	69	85	68	73	83	80
1900	66	79	68	74	76	78	70	90	75	76	86	84
1901	83	80	67	73	77	82	73	69	79	76	85	83
1902	84	83	78	75	81	86	77	76	87	80	90	82
1903	81	86	80	75	80	86	77	75	84	79	89	85
1904	82	76	76	75	82	86	68	83	73	82	88	85
1905	95	76	82	111	85	91	75	98	87	84	88	85
1906	110	85	84	81	88	95	79	99	82	89	88	105
1907	115	97	91	82	90	101	88	107	84	92	91	103
1908	97	96	87	69	87	100	85	82	74	83	92	99
1909	100	91	92	90	96	98	79	105	80	95	91	98
1910	101	91	92	93	108	99	90	109	72	96	93	99
1911	100	90	94	94	116	99	84	112	92	97	94	100
1912	104	98	95	96	113	99	81	116	105	99	96	99
1913	98	104	101	99	116	100	89	115	105	100	99	101
1914	100	100	100	100	100	100	100	100	100	100	100	100
1915	102	97	102	101	102	99	-------	106	78	98	91	101
1916	164	118	133	132	132	121	-------	158	88	119	116	132
1917	168	143	150	146	161	152	131	184	127	130	147	138
1918	206	202	186	184	202	197	129	227	147	163	161	184
1919	200	210	190	177	219	193	173	257	221	209	171	230
1920	235	255	220	208	266	210	220	325	292	286	228	228
1921	221	198	200	191	227	195	133	153	162	189	170	196
1922	225	192	189	194	228	204	180	185	177	214	170	221
1923	268	220	242	226	249	217	216	272	259	238	178	282
1924	234	209	201	198	227	189	233	238	193	232	158	225
1925	234	204	235	216	221	197	227	259	235	230	185	207
1926	234	204	236	225	215	196	219	263	238	235	189	210
1927	236	211	238	233	214	196	217	258	243	232	187	207

[1] Not including rubber boots and shoes.
[2] Not including operations of railroad companies.

1920 and 1921, the drop which in earlier tables seemed apparent between 1919 and 1921 being, in reality, made up in respect to most of the industries, of an appreciable rise between 1919 and 1920 and a still more appreciable fall between 1920 and 1921. In the cotton manufactures industry, for example, earnings were evidently lower per capita in both 1919 and 1921 than in 1920. For these industries, moreover, it is possible to include figures for 1923, 1925 and 1927, and they bear out the impression created by the census year tables that there was a very considerable increase in money earnings between 1921 and 1923 and a still further increase between 1923 and 1925. Indeed each one of the 12 industries shown in Table 92 participated in the increase between 1921 and 1923, some, it is true, only slightly, as in the case of boots and shoes, but others, including the leather and iron and steel and automobile industries, shared in it very heavily. Between 1925 and 1927 the increases are fewer and less marked.

REGIONAL VARIATIONS IN SELECTED INDUSTRIES

The final table of relative money earnings is Table 93, which is designed to bring out for identical industries the differences prevailing in different parts of the country. For this purpose 24 industries are shown. A similar table was presented in Part II and it showed wide differences in the *amounts* of earnings received in identical industries in different parts of the country. This table of relatives shows no less significant differences as to the degree of change in earnings in identical industries in different parts of the country. In men's clothing, for example, it shows that there has been a very much greater increase in money earnings in Illinois than in New York, the first and last relatives being 68 and 247 for Illinois and 87 and 248 for New York. In cotton manufactures, there appears to have been a fourfold increase in per capita earnings in North Carolina, as compared to a less than threefold increase in Massachusetts. In silk goods, the State of Pennsylvania evidently has witnessed a greater increase in earnings than the State of New Jersey; in the furniture industry, earnings have increased more rapidly in Michigan than in New York; in printing and publishing, newspapers, per capita earnings in Illinois have increased more rapidly than in New York; in the blast-furnace division of the iron and steel industry, money earnings have increased much more rapidly in Alabama than in Pennsylvania; in foundry and machine-shop products, per capita earnings have increased more rapidly in Ohio than in New York; in electrical machinery, apparatus, and supplies, New York again suffers by comparison with Illinois, where earnings have increased much more rapidly than in the former State.

TABLE 93.—INDEX NUMBERS OF ACTUAL MONEY EARNINGS OF MALE WAGE EARNERS, PER CAPITA, IN 24 SELECTED INDUSTRIES, BY SELECTED STATES, CENSUS YEARS: 1899–1921

[1914=100]

INDUSTRY AND STATE	1899	1904	1909	1914	1919	1921
Tobacco, cigars and cigarettes:						
Florida	79	96	96	100	165	154
Pennsylvania	92	96	98	100	216	197
Clothing, men's:						
New York	87	87	101	100	245	248
Illinois	68	82	83	100	226	247
Clothing, women's:						
New York	76	80	98	100	220	230
Illinois	60	82	95	100	198	197
Cotton manufactures:						
Massachusetts	79	79	98	100	214	202
North Carolina	57	68	90	100	239	197
Knit goods:						
Pennsylvania	72	74	85	100	180	207
New York	76	76	96	100	179	199
Shirts:						
New York	86	84	102	100	190	209
Pennsylvania	79	87	99	100	152	167
Silk goods, including throwsters:						
Pennsylvania	60	70	89	100	191	210
New Jersey	72	73	91	100	188	191
Woolen goods:						
Massachusetts	74	82	93	100	211	214
Pennsylvania	78	77	93	100	228	210
Worsted goods:						
Massachusetts	74	77	93	100	197	202
Pennsylvania	74	79	91	100	223	214
Boots and shoes, not including rubber boots and shoes:						
Massachusetts	77	85	95	100	178	181
Missouri	74	87	104	100	164	190
Leather, tanned, curried, and finished:						
Massachusetts	83	85	95	100	210	201
Pennsylvania	74	80	92	100	224	202
Furniture:						
New York	82	88	99	100	197	211
Michigan	70	80	92	100	195	211
Lumber and timber products:						
Washington	74	90	99	100	208	153
Louisiana	64	89	86	100	201	142
Lumber, planing-mill products, not including planing mills connected with sawmills:						
New York	77	88	98	100	187	213
California	71	88	103	100	154	162
Paper and wood pulp:						
New York	74	83	95	100	214	212
Maine	69	81	97	100	200	206
Printing and publishing, newspapers and periodicals:						
New York	76	84	95	100	154	197
Illinois	69	91	96	100	161	227
Printing and publishing, book and job:						
New York	81	84	96	100	191	229
Illinois	68	80	91	100	182	208
Glass:						
Pennsylvania	84	100	94	100	201	170
West Virginia	65	93	99	100	194	188
Iron and steel, blast furnaces:						
Pennsylvania	64	69	87	100	244	161
Alabama	51	70	107	100	261	179
Iron and steel, steel works and rolling mills:						
Pennsylvania	80	80	100	100	250	142
Ohio	76	82	98	100	243	137
Foundry and machine-shop products:						
Ohio	77	81	98	100	209	148
New York	81	83	99	100	194	143
Agricultural implements:						
Illinois	64	72	83	100	166	136
Indiana	76	81	92	100	222	142
Electrical machinery, apparatus, and supplies:						
New York	83	83	105	100	188	138
Illinois	64	69	96	100	158	151
Chemicals:						
New Jersey	80	83	93	100	192	174
New York	75	83	91	100	208	163

Chapter IX

CHANGES IN REAL EARNINGS

It is necessary to make two important discounts from the estimated amounts of full-time earnings in order to reach results which may have some colorable claim to serve as indices of changes in the economic well-being of wage earners in different industries and in different parts of the country and to indicate the changes which have taken place in their economic welfare. The two adjustments referred to are, first, the subtraction from full-time earnings of whatever proportion of them is estimated to represent unemployment, or underemployment, the remainder being taken to represent actual money earnings; second, the process of deflating these money earnings by application of the cost of living index. The result of this process of deflation is a series of estimates of relative real labor incomes, and it is these results that are presented in this chapter.

FACTORS AFFECTING REAL EARNINGS

Before discussing the data for real earnings it is appropriate to reconsider briefly the different factors which in some degree affect real earnings; for it is of the interplay of these factors that real earnings may be said to be the resultant. The factors referred to are existing wage rates (both time and piece), the prices of the necessities and comforts of life which wage earners buy, and the amount of employment. The tendency, speaking by and large, and disregarding such lags as that between wages and general prices, is for these three factors of influence to rise together and fall together. However, the three factors by no means always fluctuate together, and even when they do so in point of time the degree of fluctuation is almost always different in the case of the different factors. To the extent that retail prices and the amount of unemployment remain the same, the effect of increased wage rates is to bring about a proportionate increase in the purchasing power of money earnings. In so far as wage rates and retail prices remain the same, the effect of variations in the amount of unemployment is to bring about an inverse change in the purchasing power of a worker's earnings—that is to say, his real earnings are increased with each diminution in the amount of unemployment and decreased with each increase in the amount of unemployment. Assuming that wage rates and the amount of unemployment remain the same, the effect of changing prices upon the purchasing power of wage earners' income is

also inverse—that is to say, to the degree the prices fall to that degree the purchasing power of a worker's income rises. The process of deflating money wages has for its object, of course, neutralization or elimination of the effect of price fluctuations upon the purchasing power of wage rates or earnings. It is evident that the present series of relatives of real earnings represents the amounts of purchasing power received in any given year, which amounts, in turn, are the cumulated aggregates of time rates of pay received for all of the time actually worked during the year. This is, of course, strictly true only if the time rates are hourly rates, because weekly or monthly rates give no indication of the exact time during which labor was performed; the hour does do it. In other words, the year's real earnings may be thought of as the number of deflated dollars which the average wage earner received (unfortunately we still have to deal with the average wage earner) for whatever number of hours, at a constant rate or at varying rates, he put in during the year.

TWENTY-NINE YEARS OF FLUCTUATION IN REAL EARNINGS

The changes which have taken place in real earnings in manufacturing industries generally in the 29 years since 1899 are indicated in summary Table 94, in connection with which the reader should again examine Figure 5 on page 55. It is evident, if these figures can be relied on, that between 1899 and 1927 there has been a large appreciation of the purchasing power of manufacturing wage earners' annual income, the largest increases apparently having taken place between the census years 1921 and 1925. During the first five years of the quarter-century period under review there was little change

TABLE 94.—INDEX NUMBERS OF THE PURCHASING POWER (IN TERMS OF THE DOLLAR OF 1914) OF ACTUAL ANNUAL LABOR INCOMES, PER CAPITA, IN THE UNITED STATES, ALL INDUSTRIES COMBINED, EACH YEAR: 1899–1927

YEAR	Index of real earnings	Link relatives of year-to-year change	YEAR	Index of real earnings	Link relatives of year-to-year change
1899	105		1914	100	−7.5
1900	103	−2.0	1915	108	7.6
1901	105	2.2	1916	125	15.8
1902	108	2.8	1917	116	−7.1
1903	103	−4.5	1918	122	5.4
1904	101	−1.9	1919	118	−3.7
1905	112	11.0	1920	126	7.2
1906	115	2.2	1921	103	−18.0
1907	110	−3.6	1922	122	18.5
1908	99	−10.4	1923	146	17.0
1909	111	12.3	1924	135	−7.5
1910	106	−5.0	1925	143	6.0
1911	98	27.6	1926	144	1.0
1912	107	9.8	1927	140	−2.5
1913	108	1.0			

in real earnings, what there was took the form, evidently, of a slight decline. This situation was the result of the combined effect of a slowly rising cost of living during that period, a somewhat less gradual rise in wage rates, and an increase between 1899 and 1900, and again in 1903 and 1904 in the amount of unemployment. The pronounced drop in purchasing power in 1903-1904 was the result, chiefly, of a large increase in unemployment, which was reinforced to some extent in 1903 by a continued rise in the cost of living, with a resultant reduction in purchasing power, despite the continued rise of yearly rates of wages. The two years following 1904 were characterized by considerable gains in the purchasing power of actual labor incomes. During these two years and even in 1907, which witnessed some recession, earnings were appreciably above the level of 1899 and 1900. This high level of purchasing power was the result of somewhat accelerated increases in wage rates, but it was due more largely to diminution in the amount of unemployment. The increases in purchasing power would have been still greater were it not that the third factor—cost of living—underwent a somewhat more rapid increase than in the preceding years, and this, of course, tended to offset in part the resultant high purchasing power which would otherwise have been brought to the wage earner as a result of increased rates and diminished unemployment.

In 1908 came a much larger drop in purchasing power than occurred four years earlier. This decline pulled down the manufacturing wage-earners buying power to the lowest point within the quarter century here surveyed; although in 1914 it dropped to a low level which topped that of 1908 by a negligible margin. The drop in 1908 was brought about primarily, of course, by a very large increase in unemployment. This decline in employment was reinforced in its effect upon purchasing power by a slackening, which was so marked, indeed, for two or three years following 1907, as to take the form of a decline in the rise in rates. The loss in buying power would have been even greater were it not for the fact that living costs turned downward between 1907 and 1909. After 1908 and until 1915 the wage earners buying power fluctuated irregularly but not widely, about the level of the year 1900. The persistence of low levels of purchasing power for this period resulted, at least so far as the period up to 1915 is concerned, from intermittent declines in employment, especially marked in 1911 and 1914, reinforced by renewed increases in the cost of living, both of which factors tended to more than offset the moderate increases which took place in rates. After 1916 employment fell off somewhat and 1917 and 1919 saw minor recessions in real earnings. In 1920 the buying power of earnings reached a high level which up to that time had never been reached—and which had been nearly approached in only one preceding year—1916. The year 1920 marked

the peak in employment for industry generally and the crest of the wave of business prosperity. The high point of purchasing power reached in 1920 was the joint result of increased employment and higher rates of wages, both of which increased even more rapidly than the cost of living. But 1920 does not mark the peak year of real earnings as it does the peak of the cost of living. This is partly due, of course, to the increased unemployment which began to be evident a considerable time before the year 1920 had passed. There were also large drops in living costs and in rates before the beginning of 1921. The drop in purchasing power in 1921 was simply one phase of the depression of that year.

It appears on the face of the figures, however, that there was no such precipitate fall in purchasing power from 1920 to 1921 as there was in money earnings. This less unfavorable feature of the situation was probably due to the rapid drop in the cost of living following the break in prices in 1921. This break in commodity prices preceded for the most part the break in prices of labor; that is to say, in the rates of wages, and where the wage earner had lagged behind other prices on the upgrade, he now was able to make up, at least in part, for that disadvantage, for his rates persisted at relatively high levels for appreciable periods after general prices had fallen headlong. The result of all this was, of course, the maintenance of purchasing power at points less low than those to which they would otherwise have fallen.

The peak in real earnings came in 1923. Following 1921 and persisting through 1922 and 1923, and, after a sag in 1924, through 1925 and 1926 a quite unprecedented increase in the purchasing power of money earnings took place. So great an increase was it, apparently, that it not only exceeded any other increase in the records of the quarter century but has put the purchasing power of labor incomes in manufacturing far above the 1900 level and in 1923, 1924, 1925, and 1926 boosted them to high points not reached before in the quarter century with which we are dealing.

Yet, it is clear from the figures given in Table 94 that because there has been an increase of relative earnings from 105 in 1899 to 146 in 1923, and to 143 in 1925, it does not by any means follow that manufacturing wage earners have been better off economically all through the 29-year period than they were before the beginning of it. If the figures are reasonably accurate it may be said, of course, that manufacturing wage earners were better off in 1923 than they were in 1899 and, indeed, in any other year of the 29-year period. But wage earners are not living only in the year 1923; in fact they must live longer than the whole period shown in this table; but even if we assume that this period from 1899 to 1927 represents the working life span of the manufacturing wage earner, it is evident that during a large part of

the period he was no better off economically than he was at the beginning of the period.

BALANCE OF GAINS AND LOSSES THROUGH THE QUARTER CENTURY

It is important then not only to inquire whether the wage earner is receiving higher real earnings than he formerly received, a question which as of 1925 we, fortunately, can answer with an emphatic affirmative, but also to ascertain for what proportion of the period under consideration the wage earner was worse off, and for what proportion he was better off, than in 1899. This latter question gets some light from the figures of Table 94. It appears that there were seven years in which the purchasing power of money earnings was no greater or was even less than it was at the beginning of the century. These losses, as well as the much greater gains, in buying are represented in Figure 5 by the areas marked off from the curve representing real earnings by the dotted projection of the purchasing power level of 1899–1900. The shaded area above the projection line represents the extent of accomplished gains in purchasing power over 1899, whereas the shaded area below that line represents corresponding amounts of purchasing power lost during the period covered. None of this comment, of course, presumes even to raise the question whether the absolute purchasing power of manufacturing wages in 1899–1900 was as high as it ought to be, or too high.

Estimated monthly changes in annual rates of real and money income, per capita, are shown in Figure 24 for the period from January, 1915, to December, 1927, inclusive. The data from which this chart was drawn are given in Table 22. The chart shows in greater time detail the fluctuations in labor income during the last 13 years of the period under examination.

FLUCTUATIONS AMONG THE INDUSTRIES

It will not do to stop with a showing of the apparent fluctuations in real earnings for all industries combined. Such a showing is all the more inadequate because of the likelihood that wider changes up and down in the separate industries, and groups of industries, will have to some extent canceled each other in the figures which are given for all industries combined. This is less likely to be the case to any serious degree in view of the fact that the index numbers for all industries combined are not made by averaging the relatives for separate industries, but are computed directly from the census average wage, obtained by dividing aggregate amounts paid in wages in all manufacturing establishments by the aggregate number of wage earners in those establishments. But even with this method in use it still remains eminently desirable to inquire into the fluctuations in the separate industries.

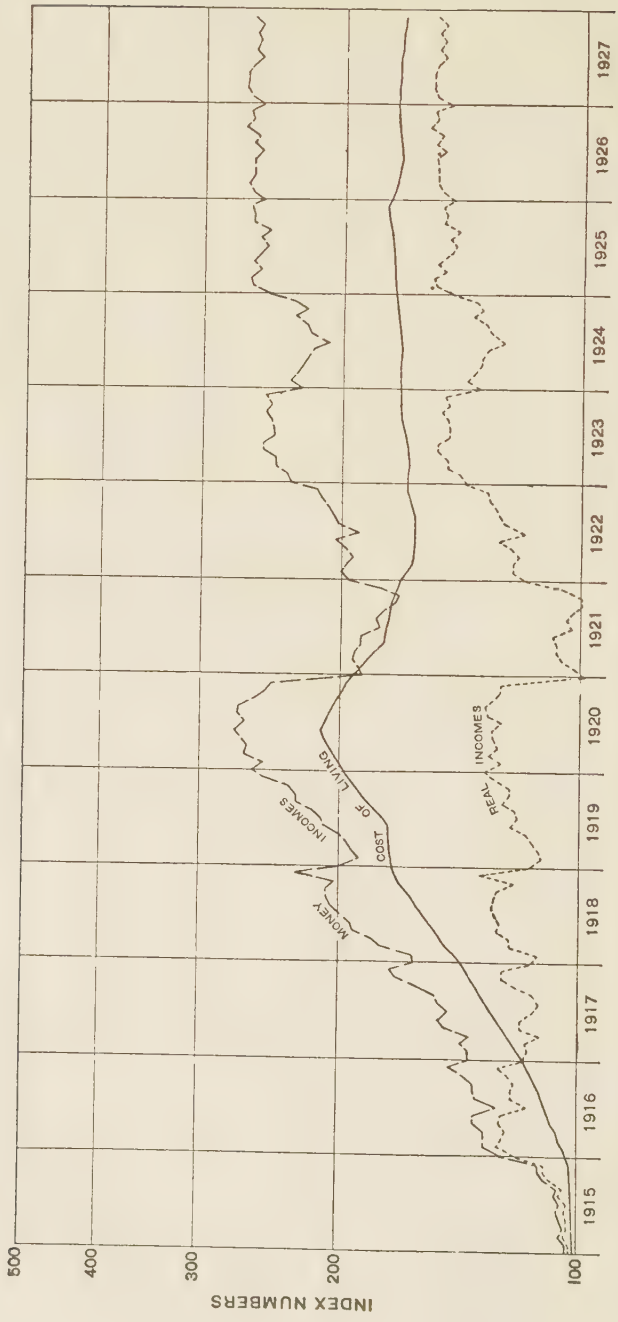


FIG. 24.—MONTHLY INDEXES OF MANUFACTURING LABOR INCOMES, PER CAPITA, AND OF THE COST OF LIVING, JANUARY, 1915, TO DECEMBER, 1927

A summary classification of the 41 selected industries is presented in Table 95. The table shows, for each manufactures census year since 1899, the number of industries in which relative real earnings per capita (on the 1914 base) fell within the specified groups. There is noticeable, first of all, a vastly greater degree of uniformity as between the different industries from one census year to another than has appeared to be the case in a similar arrangement of data based on money earnings and presented in the preceding chapter. Yet there is observable in the postwar part of the period an extraordinarily wide dispersion between the industries in respect to their respective per capita earnings. The years 1899, 1904, and 1909 seem to reflect especially great concentration among the industries at central points; thus in 1904 in 11 out of 41 industries, the relatives of per capita real earnings were between 95 and 99. In the following census year, 1909, in 11 out of 41 industries, the per capita real earnings were between 100 and 105. In 1899 in one industry the

TABLE 95.—THE 41 SELECTED INDUSTRIES AND THE WAGE EARNERS EMPLOYED THEREIN, DISTRIBUTED ACCORDING TO RELATIVE "REAL" EARNINGS, PER CAPITA, PREVAILING IN EACH INDUSTRY, CENSUS YEARS: 1899–1925

[In 1914 *all* industries are in the relative earnings group 100–104, since 1914 is taken as the base, or 100]

RELATIVE "REAL" EARNINGS (1914=100)	THE NUMBER OF INDUSTRIES IN EACH RELATIVE EARNINGS GROUP AND PERCENTAGE BORNE BY THE AVERAGE NUMBER OF WAGE EARNERS IN THOSE INDUSTRIES TO THE TOTAL NUMBER OF WAGE EARNERS IN ALL MANUFACTURING INDUSTRIES							
	1899*		1904		1909		1919	
	Number [1]	Per cent	Number [2]	Per cent	Number [3]	Per cent	Number [4]	Per cent
65–69								
70–74								
75–79								
80–84			[a] 2	0.22				
85–89	[a] 2	4.91	[b] 3	1.88			[a] 1	0.38
90–94	[b] 3	1.19	[c] 7	11.42	[a] 3	1.69	[b] 1	1.32
95–99	[c] 11	13.90	[d] 7	12.56	[b] 1	.67	[c] 8	8.59
100–104	[d] 6	21.89	[a] 11	16.44	[c] 9	13.70	[d] 3	3.65
105–109	[a] 7	8.34	[f] 7	18.65	[d] 8	19.16	[a] 8	8.85
110–114	[f] 7	12.40	[a] 4	13.10	[a] 12	15.62	[f] 4	5.42
115–119	[a] 2	7.69			[f] 5	10.65	[a] 4	9.12
120–124	[b] 1	.15			[a] 3	13.17	[b] 6	18.68
125–129							[c] 3	5.90
130–134								
135–139							[f] 1	1.78
140–144							[b] 1	4.12
145–149							[f] 1	.46
150–154								
155–159								
160–164								
165–169								
170–174								
175–179								
180–184								
Total (41 industries)	39	70.47	41	74.27	41	74.66	41	68.27
Not reported here		29.53		25.73		25.34		31.73
Total wage earners in all manufacturing industries	4,712,763		5,468,383		6,615,046		9,096,372	

* 39 industries only reported for 1899, data for "Automobiles, bodies and parts," and "Chemicals" being unavailable.

(See pp. 196 and 197 for footnotes)

TABLE 95.—THE 41 SELECTED INDUSTRIES AND THE WAGE EARNERS EMPLOYED THEREIN, DISTRIBUTED ACCORDING TO RELATIVE "REAL" EARNINGS, PER CAPITA, PREVAILING IN EACH INDUSTRY, CENSUS YEARS: 1899–1925—Contd.

[In 1914 *all* industries are in the relative earnings group 100–104, since 1904 is taken as the base, or 100]

RELATIVE "REAL" EARNINGS (1914=100)	THE NUMBER OF INDUSTRIES IN EACH RELATIVE EARNINGS GROUP AND PERCENTAGE BORNE BY THE AVERAGE NUMBER OF WAGE EARNERS IN THOSE INDUSTRIES TO THE TOTAL NUMBER OF WAGE EARNERS IN ALL MANUFACTURING INDUSTRIES					
	1921		1923		1925†	
	Number [5]	Per cent	Number [6]	Per cent	Number [7]	Per cent
65–69	[a] 1	0.27				
70–74						
75–79	[b] 2	3.07				
80–84						
85–89	[c] 1	3.39				
90–94	[d] 5	6.70				
95–99	[e] 6	8.87				
100–104	[f] 4	10.11				
105–109	[g] 6	7.60	[a] 1	1.48	[g] 2	1.99
110–114	[h] 7	14.48			[b] 1	.39
115–119	[i] 2	2.42	[b] 3	.97	[c] 2	2.85
120–124	[j] 3	5.78	[c] 3	2.15	[d] 4	7.39
125–129	[h] 3	6.46	[d] 7	9.34	[e] 4	5.58
130–134			[e] 3	9.71	[f] 5	6.50
135–139			[f] 4	7.35	[g] 8	12.85
140–144	[k] 1	.33	[g] 4	5.49	[h] 1	1.51
145–149			[h] 5	13.31	[i] 3	11.23
150–154			[i] 5	9.44	[j] 4	12.08
155–159			[j] 3	5.73	[k] 2	3.06
160–164			[h] 1	4.42	[l] 2	1.78
165–169			[l] 1	.68	[m] 1	2.16
170–174						
175–179						
180–184			[m] 1	.40		
Total (41 industries)	41	69.48	41	70.47	39	69.37
Not reported here		30.52		29.53		30.63
Total wage earners in all manufacturing industries	6,946,570		8,778,173		8,384,261	

† 39 industries only reported for 1925. Data for "Mineral and soda waters" and "Liquors, malt" being unavailable.

[1] The industries represented by the figures in this column are:

[a] Brick and tile, terra-cotta, and fire-clay products; Woolen and worsted goods.

[b] Automobiles; Cars, steam-railroad; Rubber tires, inner tubes, and rubber goods, not elsewhere specified.

[c] Agricultural implements; Bread and bakery products; Clothing, women's; Confectionery; Iron and steel, blast furnaces; Knit goods; Lumber, planing-mill products; Paper and wood pulp; Printing and publishing, newspapers and periodicals; Silk goods; Shipbuilding, steel.

[d] Clothing, men's; Cotton manufactures; Furniture; Liquors, malt; Lumber and timber products; Printing and publishing, book and job.

[e] Boots and shoes; Flour-mill and gristmill products; Glass; Leather, tanned, curried, and finished; Mineral and soda waters; Shirts; Slaughtering and meat packing.

[f] Dyeing and finishing textiles; Carpets and rugs, other than rag; Electrical machinery, apparatus, and supplies; Iron and steel, steel works and rolling mills; Railroad repair shops, steam; Smelting and refining copper, lead, and zinc; Tobacco, cigars, and cigarettes.

[g] Foundry and machine-shop products; Petroleum refining.

[h] Railroad repair shops, electric.

[2] The industries represented by the figures in this column are:

[a] Automobiles; Automobiles, bodies and parts.

[b] Agricultural implements; Cars, steam-railroad; Rubber tires, inner tubes, and rubber goods, not elsewhere specified.

[c] Cotton manufactures; Confectionery; Iron and steel, blast furnaces; Knit goods; Petroleum refining; Shipbuilding, steel; Silk goods.

[d] Clothing, men's; Clothing, women's; Paper and wood pulp; Printing and publishing, book and job; Printing and publishing, newspapers and periodicals; Woolen and worsted goods; Shirts.

[e] Boots and shoes; Carpets and rugs, other than rag; Chemicals; Dyeing and finishing textiles; Electrical machinery, apparatus and supplies; Furniture; Glass; Iron and steel, steel works and rolling mills; Liquors, malt; Lumber, planing-mill products; Leather, tanned, curried, and finished.

[f] Brick and tile, terra-cotta, and fire-clay products; Flour-mill and gristmill products; Foundry and machine shop products; Mineral and soda waters; Railroad repair shops—electric; Railroad repair shops—steam; Tobacco, cigars and cigarettes.

[g] Bread and other bakery products; Lumber and timber products; Slaughtering and meat packing; Smelting and refining, copper, lead, and zinc.

[3] The industries represented by the figures in this column are:
- [a] Automobiles; Cars, steam-railroad; Glass.
- [b] Confectionery.
- [c] Automobiles, bodies and parts; Agricultural implements; Cotton manufactures; Chemicals; Knit goods; Liquors, malt; Petroleum refining; Mineral and soda waters; Tobacco, cigars and cigarettes.
- [d] Flour-mill and gristmill products; Lumber, planing-mill products; Lumber and timber products; Paper and wood pulp; Printing and publishing, book and job; Printing and publishing, newspapers and periodicals; Shipbuilding, steel; Silk goods.
- [e] Boots and shoes; Clothing, men's; Clothing, women's; Dyeing and finishing textiles; Furniture; Iron and steel, blast furnaces; Leather, tanned, curried, and finished; Railroad repair shops—electric; Rubber tires, inner tubes, and rubber goods, not elsewhere specified; Shirts; Slaughtering and meat packing; Smelting and refining, copper, lead, and zinc.
- [f] Brick and tile, terra-cotta and fire-clay products; Carpets and rugs, other than rag; Electrical machinery, apparatus and supplies; Railroad repair shops—steam; Woolen and worsted goods.
- [g] Bread and other bakery products; Foundry and machine shop products; Iron and steel, steel works and rolling mills.

[4] The industries represented by the figures in this column are:
- [a] Liquors, malt.
- [b] Printing and publishing, newspapers and periodicals.
- [c] Automobiles; Glass; Knit goods; Lumber, planing-mill products; Mineral and soda waters; Smelting and refining, copper, lead, and zinc; Shirts; Tobacco, cigars and cigarettes.
- [d] Automobiles, bodies and parts; Confectionery; Printing and publishing, book and job.
- [e] Agricultural implements; Boots and shoes; Bread and other bakery products; Dyeing and finishing textiles; Flour-mill and grist mill products; Furniture; Railroad repair shops—electric; Silk goods.
- [f] Chemicals; Electrical machinery, apparatus, and supplies; Petroleum refining; Woolen and worsted goods.
- [g] Brick and tile, terra-cotta and fire-clay products; Clothing, women's; Cotton manufactures; Paper and wood pulp.
- [h] Carpets and rugs, other than rag; Cars, steam-railroad; Clothing, men's; Foundry and machine shop products; Lumber and timber products; Railroad repair shops—steam.
- [i] Leather, tanned, curried, and finished; Rubber tires, inner tubes, and rubber goods, not elsewhere specified; Shipbuilding, steel.
- [j] Slaughtering and meat packing.
- [k] Iron and steel, steel works and rolling mills.
- [l] Iron and steel, blast furnaces.

[5] The industries represented by the figures in this column are:
- [a] Smelting and refining, copper, lead, and zinc.
- [b] Automobiles; Automobiles, bodies and parts.
- [c] Iron and steel, steel works and rolling mills.
- [d] Cars, steam-railroad; Chemicals; Foundry and machine shop products; Liquors, malt; Railroad repair shops—Electric.
- [e] Agricultural implements; Glass; Iron and steel, blast furnaces; Lumber and timber products; Mineral and soda waters; Tobacco, cigars and cigarettes.
- [f] Electrical machinery, apparatus, and supplies; Petroleum refining; Railroad repair shops—steam; Shipbuilding, steel.
- [g] Confectionery; Knit goods; Lumber, planing-mill products; Paper and wood pulp; Rubber tires, inner tubes, and rubber goods, not elsewhere specified; Shirts.

Footnote [5]—Continued.
- [h] Boots and shoes; Brick and tile, terra-cotta and fire-clay products; Cotton manufactures; Flour-mill and gristmill products; Furniture; Leather, tanned, curried, and finished; Silk goods.
- [i] Dyeing and finishing, textiles; Slaughtering and meat packing.
- [j] Bread and other bakery products; Clothing, women's; Printing and publishing, newspapers and periodicals.
- [k] Clothing, men's; Printing and publishing, book and job; Woolen and worsted goods.
- [l] Carpets and rugs, other than rag.

[6] The industries represented by the figures in this column are:
- [a] Tobacco, cigars, and cigarettes.
- [b] Flour-mill and gristmill products; Liquors, malt; Smelting and refining, copper, lead, and zinc.
- [c] Confectionery; Glass; Shirts.
- [d] Agricultural implements; Automobiles; Boots and shoes; Bread and other bakery products; Chemicals; Mineral and soda waters; Petroleum refining.
- [e] Automobiles, bodies and parts; Cotton manufactures; Knit goods.
- [f] Dyeing and finishing textiles; Lumber and timber products; Railroad repair shops—electric; Shipbuilding, steel.
- [g] Lumber and planing-mill products; Paper and wood pulp; Silk goods; Slaughtering and meat packing.
- [h] Clothing, men's; Clothing, women's; Electrical machinery, apparatus, and supplies; Printing and publishing, newspapers and periodicals; Railroad repair shops—steam.
- [i] Cars, steam railroad; Foundry and machine shop products; Iron and steel, blast furnaces; Printing and publishing, book and job; Rubber tires, inner tubes, and rubber goods, not elsewhere specified.
- [j] Brick and tile, terra-cotta and fire-clay products; Furniture; Woolen and worsted goods.
- [k] Iron and steel, steel works and rolling mills.
- [l] Leather, tanned, curried, and finished.
- [m] Carpets and rugs, other than rag.

[7] The industries represented by the figures in this column are:
- [a] Shirts; Tobacco, cigars and cigarettes.
- [b] Smelting and refining, copper, lead, and zinc.
- [c] Boots and shoes; Flour-mill and gristmill products.
- [d] Agricultural implements; Cotton manufactures; Glass; Leather, tanned, curried, and finished.
- [e] Bread and other bakery products; Chemicals; Petroleum refining; Knit goods.
- [f] Automobiles; Clothing, men's; Confectionery; Dyeing and finishing textiles; Shipbuilding, steel.
- [g] Cars, steam railroads; Iron and steel, blast furnaces; Paper and wood pulp; Railroad repair shops—electric; Railroad repair shops—steam; Silk goods; Slaughtering and meat packing; Woolen and worsted goods.
- [h] Clothing, women's.
- [i] Automobiles, bodies and parts; Electrical machinery, apparatus and supplies; Lumber and timber products.
- [j] Foundry and machine-shop products; Iron and steel, steel works and rolling mills; Lumber, planing-mill products; Printing and publishing, book and job.
- [k] Brick and tile, terra-cotta and fire-clay products; Printing and publishing, newspapers and periodicals.
- [l] Carpets and rugs, other than rag; Rubber tires, inner tubes, and rubber goods, not elsewhere specified.
- [m] Furniture.

wage earners received real earnings per capita which were 20 to 25 per cent greater than the average wage earner in the same industry received in 1914. In two industries in the same year the wage earners received per capita 15 to 20 per cent more than in the same industries in 1914. In 1921 the largest single group of industries, seven in number, received per capita real earnings from 10 to 15 per cent greater than were received by wage earners in the same industries in 1914. But in five industries the wage earners received in 1921 per capita real earnings between 5 and 10 per cent less than they received in 1914. These five industries, moreover, included 6.7 per cent of all manufacturing wage earners. In the right-hand columns, under each census year, are the percentages borne by the wage earners employed in the group of industries to the left, to all manufacturing wage earners.

TABLE 96.—MEDIAN, DECIL,[1] AND EXTREME INDUSTRY RELATIVES OF THE PURCHASING POWER OF ESTIMATED MONEY EARNINGS RECEIVED, PER CAPITA, IN EACH CENSUS YEAR: 1899–1925

[1914=100]

	1899 [2]	1904	1909	1914	1919	1921	1923	1925 [3]
Maximum relative	124	114	121	100	146	141	180	166
Ninth decil	114	109	117	100	128	124	158	156
Eighth decil	112	106	114	100	122	117	153	153
Seventh decil	108	104	112	100	117	111	148	145
Sixth decil	107	102	111	100	112	109	144	138
Median	102	100	109	100	109	106	139	136
Fourth decil	99	99	108	100	108	102	134	134
Third decil	98	96	104	100	102	96	128	129
Second decil	96	91	102	100	99	93	126	124
First decil	92	89	101	100	96	90	119	116
Minimum relative	87	81	91	100	88	68	97	108
All industries, average	105	101	111	100	118	103	146	143

[1] The decils are those points in the percentage scale of relative real earnings which divide the whole number of relatives for each year into 10 equal groups.
[2] Only 39 industries used in 1899; "Automobiles, bodies and parts," and "Chemicals" not included.
[3] Only 39 industries used in 1925, data for "Mineral and soda waters" and "Liquors, malt," not being available.

The identity of the industries making up the groups in the left-hand columns, is indicated in the footnote.

The 41 selected industries are arranged in a somewhat different way, in respect to real earnings, in Table 96, which shows for each census year the relative real earnings figure for the industry which had in that year the lowest relative of real earnings and at the other end of the scale, at the top of the column, the relative real earnings figure for the industry which had the highest real earnings relative; between these two extremes are listed the corresponding relatives pertaining to whatever industries occupied the median and decil positions when the industries were arranged according to the amount of their respective relatives of real earnings. The fluctuations and general variations in the concentration of the different industries around the median industry have been presented in graphic form in Figure 10 on page 71.

A summary for the 6 industrial divisions and the 14 groups of industries is given in Table 97 for each manufactures census year. It is

evident even from these figures, despite the fact that the individual vicissitudes of the separate industries are somewhat blurred, that some lines of industry have not shared the net gain in purchasing power over 1899 that was so clearly evident in the figures for all industries combined, as shown in this table and in Table 94. It is true that in the case of each of the 6 industrial divisions the 1923 level of real earnings was higher than the 1899 level. If, however, we examine the 14 groups of industries, we find that in tobacco manufactures the 1923 level of real earnings was exactly at the level of 1899. Moreover, in 8 of the 13 industry groups in which the 1923 levels are higher than that of 1899, there occurred more or less serious declines in real earnings between 1899 and 1914. The data of Table 97 are put into graphic form in Figure 25.

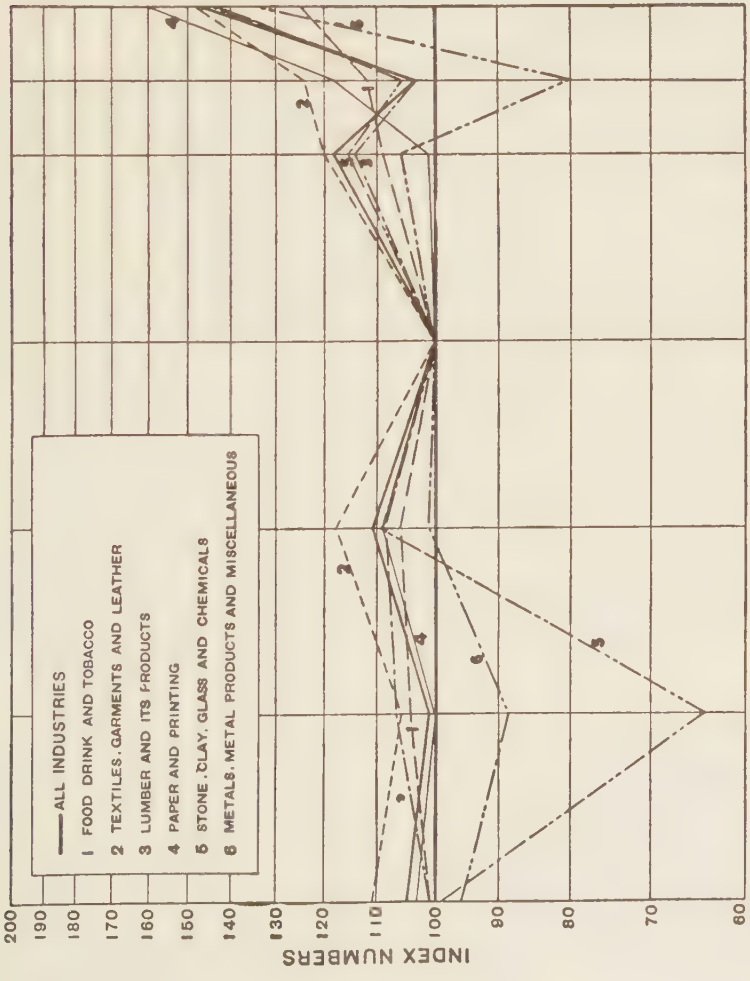


FIG. 25.—INDEX NUMBERS OF REAL LABOR INCOME, PER CAPITA, IN THE UNITED STATES, BY INDUSTRIAL DIVISIONS, CENSUS YEARS (1914 = 100)

TABLE 97.—RELATIVE FLUCTUATIONS IN REAL EARNINGS, PER CAPITA, IN THE UNITED STATES, BY INDUSTRIAL DIVISIONS AND GROUPS OF INDUSTRIES, CENSUS YEARS: 1899–1923

[1914=100]

INDUSTRY GROUP AND DIVISION	1899	1904	1909	1914	1918	1921	1923
All groups	105	101	111	100	118	103	146
I.—Food, drink, and tobacco	101	104	106	100	109	112	124
Food and kindred products	99	102	106	100	112	118	129
Liquors and beverages	103	104	102	100	91	98	103
Tobacco manufactures	111	111	111	100	108	104	117
II.—Textiles, garments, and leather	111	106	118	100	120	124	148
Textiles and products	100	95	109	100	111	115	137
Leather and its finished products	100	98	108	100	102	107	124
III.—Lumber and its products	101	107	108	100	114	103	144
IV.—Paper and printing	103	100	109	100	101	118	160
V.—Stone, clay, glass, and chemicals	99	64	109	100	115	106	144
Chemicals and allied products	97	104	106	100	122	111	149
Stone, clay, and glass products	99	108	110	100	106	101	140
VI.—Metals, metal products, and miscellaneous	96	89	101	100	106	80	133
Iron and steel and their products	107	99	114	100	120	84	147
Metals and metal products, other than iron and steel	112	105	115	100	108	84	141
Vehicles for land transportation	89	86	100	100	110	87	146
Railroad repair shops	112	105	116	100	121	103	146
Miscellaneous industries	105	98	111	100	121	90	146

ANNUAL INDEX OF THE PURCHASING POWER OF MANUFACTURING LABOR INCOMES

Annual indexes of real earnings from 1899 to 1927, for the 12 industries for which it has been possible to make interpolations, are presented in Table 98.

An examination of this table and of the Figure 26, drawn from its data, shows that 11 of the 12 industries are to be credited with higher levels of purchasing power in 1927 than in 1899. The exception is tobacco, cigars and cigarettes (1899 index, 113; 1927 index, 110). Of course, even among the 11 industries which showed a higher level in 1927 or 1925 than in 1899 there were in intervening years numerous cases where real earnings fell far below their level at the beginning of the period. This is especially noticeable in 1904, 1909, 1914, 1915, and 1921.

INTERPRETATION OF DATA ON CHANGES IN EARNINGS

Relative fluctuations in real earnings per capita for each of the 41 selected industries are indicated for census years in Table 99. There is evident here, of course, wide variations in the trend of real earnings as between the different industries. It is distinctly not to be inferred that the trend shown by these figures in the case of any industry represents the course of per capita earnings for all of the wage earners in that industry; it merely creates a presumption that that has been the course followed in respect of the real earnings of

the average worker. The figures, moreover, as has been pointed out, can be taken to represent the course of real earnings for any definite group of workers only to the degree that there is evidence that that group of wage earners remained fairly homogeneous throughout the period surveyed. If it did not remain homogeneous, the figures are certainly misleading and may be utterly worthless.[1] For example, if it should turn out in the case of any industry which

TABLE 98.—INDEX NUMBERS OF PURCHASING POWER OF MANUFACTURING LABOR INCOMES, PER CAPITA, FOR EACH OF 12 SELECTED INDUSTRIES, EACH YEAR: 1899–1927

[1914=100]

YEAR	Woolen goods	Cotton manufactures	Silk goods, including throwsters	Knit goods	Clothing, men's	Boots and shoes [1]	Automobiles	Iron and steel, steel works and rolling mills	Cars, steam-railroad [2]	Paper and wood pulp	Tobacco, cigars and cigarettes	Leather, tanned, curried, and finished
1899	87	100	99	99	101	107	93	114	92	98	113	108
1900	87	104	90	97	100	102	92	118	99	100	113	110
1901	106	102	87	94	99	105	93	89	101	98	109	106
1902	105	104	97	93	100	108	96	95	108	100	112	103
1903	96	102	95	89	95	102	92	90	100	94	106	101
1904	99	92	92	91	98	103	81	100	88	99	107	103
1905	114	92	98	134	102	109	90	118	105	101	106	103
1906	128	99	97	95	103	111	92	115	95	104	103	122
1907	126	107	100	90	99	111	97	117	92	101	100	113
1908	112	110	100	80	101	115	98	94	85	96	106	113
1909	116	104	106	103	111	113	91	121	92	109	104	113
1910	110	98	100	101	117	107	98	118	79	104	101	107
1911	106	94	98	99	122	104	88	118	96	102	99	105
1912	109	102	99	102	117	104	85	121	109	103	100	103
1913	99	105	102	100	117	101	90	116	106	100	100	102
1914	100	100	100	100	100	100	100	100	100	100	100	100
1915	104	99	104	103	104	101	90	108	80	100	93	103
1916	153	110	124	123	124	113	86	148	83	111	108	124
1917	130	111	116	113	125	118	101	142	98	100	114	107
1918	131	129	118	117	129	126	82	145	94	104	102	117
1919	112	117	106	99	122	108	97	143	123	117	96	128
1920	115	124	107	102	130	102	107	159	142	140	111	111
1921	126	112	114	109	129	111	75	87	92	107	96	111
1922	135	116	114	117	138	123	109	112	107	129	102	133
1923	159	130	143	134	148	129	128	161	153	141	106	168
1924	139	124	119	117	134	112	138	141	114	138	94	133
1925	138	120	138	127	130	116	134	152	138	135	109	122
1926	135	118	137	130	124	113	127	152	138	136	110	121
1927	138	123	139	136	125	114	127	151	142	136	110	121

[1] Not including rubber boots and shoes.
[2] Not including operations of railroad companies.

shows an apparent drop in real earnings, that during the interval when this apparent drop occurred there was introduced into the industry a considerably increased proportion of unskilled laborers, then the apparent downward trend of real earnings per capita would simply be the reflection of that infiltration of a different kind of labor—a more poorly paid kind of labor. It is evident, furthermore, that this industry into which larger proportions of unskilled labor have

[1] This subject was given some attention in Ch. I, but its importance in connection with changes in earnings seems to justify a more thorough discussion at this point.

been introduced may in 1925 actually be paying all or nearly all of those wage earners included in the figures for, say 1899, considerably higher wages than they were paid in 1899. The incomes of this group of skilled workers which originally made up the bulk of workers in the industry would then have risen appreciably, but we would

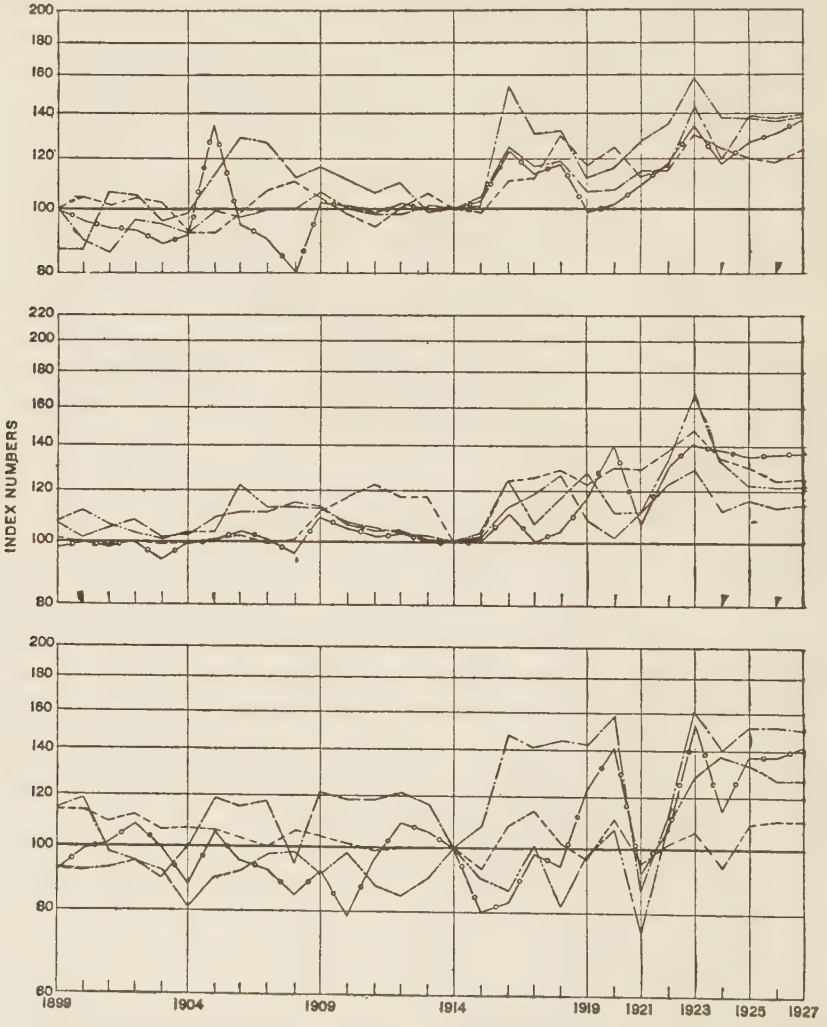


FIG. 26.—INDEX NUMBERS OF REAL EARNINGS, PER CAPITA, IN 12 SELECTED INDUSTRIES, EACH YEAR, 1899–1927 (1914=100)

not be aware of it, since we have only the figures showing per capita earnings for the whole wage-earnings personnel of the industry as the industry existed in each census year; and these figures, because of the infiltration of a lower-paid type of labor, show a diminution of per capita earnings despite the fact that there was actually an in-

crease in per capita earnings. Furthermore, there will have been no decrease in earnings even for the unskilled labor which was introduced into the industry. Their earnings may have remained the same, but the effect of their introduction into the industry, in

TABLE 99.—RELATIVE FLUCTUATIONS IN "REAL" EARNINGS, PER CAPITA, IN THE UNITED STATES, BY SELECTED INDUSTRIES, CENSUS YEARS: 1899–1925

[1914=100]

INDUSTRY	1899	1904	1909	1914	1919	1921	1923	1925
All industries				100				
Bread and other bakery products	98	112	120	100	109	121	128	129
Flour-mill and gristmill products	106	106	109	100	109	111	115	116
Confectionery	97	91	98	100	102	109	124	133
Slaughtering and meat packing	108	113	111	100	135	118	140	135
Liquors, malt	102	104	101	100	88	91	116	
Mineral and soda waters	108	109	101	100	95	97	129	
Tobacco, cigars and cigarettes	113	107	104	100	96	96	106	109
Carpets and rugs, other than rag	112	104	118	100	122	141	180	164
Shirts	109	99	111	100	96	105	122	108
Clothing, men's	101	98	111	100	122	129	148	130
Clothing, women's	96	96	111	100	117	124	149	142
Cotton manufactures	100	92	104	100	117	112	130	120
Dyeing and finishing textiles, exclusive of that done in textile mills	113	101	112	100	108	117	138	130
Knit goods	99	91	103	100	99	109	134	127
Silk goods, including throwsters	99	92	106	100	106	114	143	138
Woolen and worsted goods	87	99	116	100	112	126	159	138
Boots and shoes, not including rubber boots and shoes	107	103	113	100	108	111	129	116
Leather, tanned, curried, and finished	108	103	113	100	128	111	168	122
Furniture	103	101	111	100	108	114	155	166
Lumber and timber products	102	114	107	100	122	96	139	145
Lumber, planing-mill products, not including planing mills connected with sawmills	97	101	109	100	97	106	144	153
Paper and wood pulp	98	99	109	100	117	107	141	135
Printing and publishing, book and job	102	99	109	100	100	129	153	154
Printing and publishing, newspapers and periodicals	97	98	108	100	93	124	148	156
Chemicals		100	102	100	110	91	126	127
Petroleum refining	118	94	103	100	110	101	127	128
Brick and tile, pottery, terra-cotta, and fire-clay products	87	106	117	100	117	111	158	156
Glass	107	104	91	100	99	95	123	121
Iron and steel, blast furnaces	95	90	112	100	146	97	154	139
Iron and steel, steel works and rolling mills	114	100	121	100	143	87	161	152
Foundry and machine-shop products	118	108	121	100	120	93	152	150
Smelting and refining, copper, lead, and zinc	111	112	114	100	98	68	119	110
Automobile bodies and parts		84	102	100	101	79	134	145
Automobiles	93	81	91	100	97	75	128	134
Cars, steam-railroad, not including operations of railroad companies	92	88	92	100	123	92	153	138
Railroad repair shops—electric	124	109	114	100	105	90	137	136
Railroad repair shops—steam	112	105	117	100	122	104	147	137
Agricultural implements	95	89	101	100	105	96	127	124
Rubber goods	90	86	110	100	129	107	150	160
Shipbuilding, steel	99	91	105	100	128	103	136	134
Electrical machinery, apparatus, and supplies	110	102	116	100	110	102	145	146

the absence of separate reports of the wage payments to them, is that the industry appears as one in which per capita earnings have declined.

It is in this sort of situation that there is real danger in the interpretation of the figures. It is therefore of prime importance to

marshal whatever information can be assembled to throw light on the question, Has this industry remained homogeneous throughout the period? If it has remained practically homogeneous then we may safely use the figures as representing the trend in the real earnings of the wage earners making up the work force of the industry. If it has not remained homogeneous, then, in the degree that the industry has changed in the character of labor it employs, to that degree we must discount the data presented.

Of course, it is not only by the introduction of larger proportions of skilled or of unskilled labor by which an industry's uniformly homogeneous character is altered; its composition may be changed by readjustments in the proportion of the two sexes employed in the industry. If in any given industry in 1921 there is twice as large a proportion of women or of children employed than were employed in 1899, we must not be surprised to note what appears to be an unusually heavy decline in per capita earnings. But in reality this is not a decline in per capita earnings. It is a more or less fortuitous result of the intermingling of cheaply paid labor with highly paid labor, which, despite the fact that neither kind of labor may be receiving lower earnings, produces an average which seems to indicate that all or most of those employed in the industry have received lower earnings.

Some figures bearing on this question of homogeneousness, showing the proportions of unskilled, semiskilled, and skilled labor, respectively, the proportions of women and children, and the proportion of trade-unionists employed in different industries at the different periods, are given in Tables F and G in Part VI and in Tables 11 and 12 in Chapter I. The figures showing the proportions of women and children employed have shown so little variation, except in the case of an occasional industry, that there seems to be little need for concern in regard to that factor. The available data indicating the proportions of semiskilled and unskilled labor are much more fragmentary, and in some industries there is no evidence whatever regarding changes which have taken place in the quality of labor. However, even these inadequate figures ought to be of some help in interpreting the results set forth and discussed in this and preceding chapters. As has been pointed out elsewhere, it is true that there are other factors which have a similar warping effect upon our figures, such as the proportion of men organized in unions in the different industries; the extent to which the nature of the industrial process has been changed because of technological developments, and so forth.

REGIONAL VARIATIONS IN SELECTED INDUSTRIES

The geographic differences within identical industries in respect to changes in real earnings are indicated in Table 100, which presents

TABLE 100.—RELATIVE FLUCTUATIONS OF "REAL" EARNINGS, PER CAPITA, IN EACH OF 24 SELECTED INDUSTRIES IN 2 LEADING STATES, CENSUS YEARS: 1899–1921

[1914=100]

INDUSTRY AND STATE	1899	1904	1909	1914	1919	1921
Tobacco, cigars and cigarettes:						
Florida	107	115	110	100	92	88
Pennsylvania	124	116	113	100	121	112
Clothing, men's:						
New York	118	105	116	100	137	141
Illinois	92	99	96	100	126	140
Clothing, women's:						
New York	103	96	112	100	123	131
Illinois	81	99	109	100	108	112
Cotton manufactures:						
Massachusetts	106	95	112	100	120	115
North Carolina	77	82	104	100	134	112
Knit goods:						
Pennsylvania	97	90	98	100	101	117
New York	103	92	111	100	100	113
Shirts:						
New York	116	101	117	100	106	119
Pennsylvania	107	105	113	100	85	95
Silk goods, including throwsters:						
Pennsylvania	81	84	102	100	107	119
New Jersey	98	87	105	100	105	109
Woolen goods:						
Massachusetts	100	98	107	100	118	121
Pennsylvania	105	92	107	100	127	119
Worsted goods:						
Massachusetts	101	93	107	100	110	115
Pennsylvania	100	95	104	100	125	122
Boots and shoes, not including rubber boots and shoes:						
Massachusetts	104	103	110	100	99	103
Missouri	100	105	120	100	92	108
Leather, tanned, curried, and finished:						
Massachusetts	112	102	109	100	118	114
Pennsylvania	100	97	106	100	125	115
Furniture:						
New York	111	106	113	100	110	120
Michigan	94	97	106	100	109	120
Lumber and timber products:						
Washington	100	108	114	100	116	87
Louisiana	86	108	99	100	112	81
Lumber, planing-mill products, not including planing mills connected with sawmills:						
New York	104	106	112	100	105	121
California	96	106	118	100	86	92
Paper and wood pulp:						
New York	100	101	109	100	119	120
Maine	93	97	111	100	112	117
Printing and publishing, newspapers and periodicals:						
New York	103	101	109	100	86	112
Illinois	94	109	111	100	90	129
Printing and publishing, book and job:						
New York	110	101	111	100	107	130
Illinois	92	96	104	100	102	118
Glass:						
Pennsylvania	114	120	108	100	112	97
West Virginia	87	112	113	100	108	107
Iron and steel, blast furnaces:						
Pennsylvania	86	83	100	100	136	91
Alabama	68	84	123	100	146	102
Iron and steel, steel works and rolling mills:						
Pennsylvania	109	96	114	100	140	81
Ohio	102	99	113	100	136	78
Foundry and machine-shop products:						
Ohio	104	98	112	100	117	84
New York	110	100	114	100	108	81
Agricultural implements:						
Illinois	87	87	96	100	93	77
Indiana	103	98	106	100	124	81
Electrical machinery, apparatus, and supplies:						
New York	112	100	120	100	105	79
Illinois	87	84	111	100	89	86
Chemicals:						
New Jersey	108	100	107	100	107	99
New York	102	100	105	100	116	93

the relatives for two leading States for each of 24 selected industries. For example, comparing 1899 with 1921 in the case of men's clothing, the index numbers indicate that while there was during that period a very large increase in the purchasing power of real earnings in this industry in New York, there was a still larger increase between 1914 and 1921, which more than compensated for the loss in purchasing power which occurred in that industry between 1899 and 1914. In Illinois there was, on the contrary, a gain in purchasing power between 1899 and 1914, and yet the latter year was followed by an increase in purchasing power just as great as the industry witnessed in New York, so that for Illinois we appear to have an increase in purchasing power of 52 per cent from 1899 to 1921. In women's clothing, although there was a net gain through the period, evidently a markedly different course was followed in New York from that in Illinois. In the case of silk goods there is a marked difference in the trend even between the two adjoining States of Pennsylvania and New Jersey; in the former State real earnings appear to have undergone a much larger increase between 1899 and 1921 than was the case in New Jersey. Almost the same situation appears to have prevailed in the woolen-goods industry as between Massachusetts and Pennsylvania. In iron and steel, the blast-furnace division of the industry, Pennsylvania appears to have witnessed only a slight gain in the purchasing power of money earnings, from 86 in 1899 to 91 in 1921, whereas in the same industry in Alabama there was an increase in purchasing power of money earnings from 68 to 102.

REGIONAL DIFFERENCES FOR MANUFACTURING INDUSTRY AS A WHOLE

A summary of the relatives of real earnings in each census year for different geographic regions is given in Table 101. The absolute

TABLE 101.—INDEX NUMBERS OF PURCHASING POWER (AT 1914 PRICE LEVEL) OF ANNUAL MONEY EARNINGS, PER CAPITA, IN THE UNITED STATES, ALL INDUSTRIES COMBINED, BY GEOGRAPHIC REGIONS AND DIVISIONS, CENSUS YEARS: 1899–1923

[1914=100]

REGION	1899	1904	1909	1914	1919	1921	1923
UNITED STATES	105	101	111	100	118	103	146
NORTHEAST	104	100	110	100	130	100	142
New England	109	104	114	100	127	97	133
Middle Atlantic	103	104	114	100	136	104	156
East North Central	96	97	105	100	129	100	137
West North Central	99	100	109	100	116	98	121
SOUTH	97	100	108	100	125	101	134
South Atlantic	96	97	107	100	131	104	137
East South Central	102	105	108	100	120	99	135
West South Central	98	105	107	100	110	96	121
WEST	101	107	118	100	102	91	122
Mountain	109	112	114	100	94	90	114
Pacific	98	105	122	100	104	92	124

amounts corresponding to these relatives were charted in Figure 18 (p. 139). Fluctuations in real earnings appear to have been determined chiefly by the fluctuations in the Northeast region, but it is noticeable that in 1919 real earnings in that section rose higher, relatively to 1914, than was true of the United States as a whole, and that in 1921, they dropped to a somewhat lower relative level than in the country at large. Each of the three regions saw real earnings at a higher relative level in 1923 than in 1899, the greatest gain being in the South, the least in the West. Yet in each of the three regions there occurred large declines in real earnings, lapses which were especially serious during the period from 1919 to 1921. An examination of the figures for the nine geographic regions in Table 101 will show that there was not one that did not see higher real earnings in 1923 than in 1899. The geographic division which witnessed the largest increase in purchasing power between 1899 and 1923 was the Middle Atlantic, and the one which experienced the smallest increase was the Mountain division.

A summary, showing the distribution of the 48 States and the District of Columbia, according to index numbers of real earnings per capita is given in Table 102. In an adjacent column are given the proportions of all manufacturing wage earners in the different groups of States, and in the footnotes to the table are given the names of the States in each group. As explained in connection with earlier

TABLE 102.—THE 48 STATES AND THE DISTRICT OF COLUMBIA AND THE WAGE EARNERS EMPLOYED THEREIN, DISTRIBUTED ACCORDING TO RELATIVE "REAL" ANNUAL EARNINGS, PER CAPITA PREVAILING IN EACH STATE, ALL INDUSTRIES COMBINED—CENSUS YEARS: 1899–1923

[In 1914 *all* of the States are in the relative earnings group 100-104, since 1914 is taken as the base, or 100]

RELATIVE "REAL" EARNINGS PER CAPITA (1914=100)	NUMBER OF STATES IN EACH RELATIVE EARNINGS GROUP AND PERCENTAGE BORNE BY AGGREGATE AVERAGE NUMBER OF WAGE EARNERS IN THAT GROUP OF STATES TO THE TOTAL NUMBER OF WAGE EARNERS IN ALL MANUFACTURING INDUSTRIES											
	1899		1904		1909		1919		1921		1923	
	Number [1]	Per cent	Number [2]	Per cent	Number [3]	Per cent	Number [4]	Per cent	Number [5]	Per cent	Number [6]	Per cent
75–79									[a] 2	0.22		
80–84	[a] 3	5.29	[a] 1	3.20			[a] 1	0.03	[b] 1	.07		
85–89	[b] 4	2.05	[b] 1	1.09			[b] 1	.21	[c] 6	2.98		
90–94	[c] 6	3.57	[c] 2	2.46	[a] 1	3.50	[c] 2	.34	[d] 5	5.60		
95–99	[d] 12	27.85	[d] 9	14.55	[b] 1	.12	[d] 3	3.13	[e] 15	27.42		
100–104	[e] 12	10.49	[e] 21	67.26	[c] 7	9.64	[e] 1	.12	[f] 10	38.09	[a] 1	0.10
105–109	[f] 5	32.60	[f] 8	8.44	[d] 11	20.95	[f] 2	1.23	[g] 7	24.16	[b] 3	.42
110–114	[g] 4	14.52	[g] 4	1.74	[e] 16	40.92	[g] 8	8.96	[h] 2	1.39	[c] 3	.30
115–119	[h] 3	3.85	[h] 2	1.11	[f] 12	24.96	[h] 5	3.00			[d] 6	4.38
120–124					[g] 1	.18	[i] 6	13.90			[e] 9	8.71
125–129			1	.16			[j] 6	13.30	[i] 1	.10	[f] 4	7.06
130–134							[k] 5	24.23			[g] 6	21.53
135–139							[l] 5	15.89			[h] 5	5.52
140–144							[m] 3	15.76			[i] 6	40.80
145–149											[j] 5	8.15
150–154											[k] 1	3.00
155–159												
160–164							[n] 1	.32				

(See next page for footnotes)

[1] The States represented by the numbers in this column are:
- [a] Michigan, North Carolina, South Carolina.
- [b] Idaho, Iowa, Oklahoma, West Virginia.
- [c] Alabama, Arkansas, Georgia, North Dakota, Oregon, Utah.
- [d] California, Florida, Illinois, Indiana, Maine, Maryland, Minnesota, Nebraska, New Mexico, Ohio, Vermont, Wisconsin.
- [e] District of Columbia, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Nevada, New Hampshire, South Dakota, Tennessee, Virginia, Washington.
- [f] New York, Pennsylvania, Rhode Island, Texas, Wyoming.
- [g] Delaware, Massachusetts, Montana, New Jersey.
- [h] Arizona, Colorado, Connecticut.

[2] The States represented by the numbers in this column are:
- [a] Michigan.
- [b] South Carolina.
- [c] Iowa, North Carolina.
- [d] Idaho, Indiana, Maryland, Nebraska, North Dakota, Ohio, Vermont, Virginia, West Virginia.
- [e] Alabama, California, District of Columbia, Florida, Georgia, Illinois, Kansas, Kentucky, Maine, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Oklahoma, Pennsylvania, Rhode Island, South Dakota, Texas, Utah, Wisconsin.
- [f] Connecticut, Delaware, Missouri, Nevada, New Mexico, Oregon, Tennessee, Washington.
- [g] Arizona, Arkansas, Louisiana, Wyoming.
- [h] Colorado, Mississippi.
- [i] Montana.

The States represented by the numbers in this column are:
- [a] Michigan.
- [b] Idaho.
- [c] Indiana, Iowa, Nebraska, North Carolina, South Carolina, Virginia, West Virginia.
- [d] Alabama, Arkansas, Illinois, Kentucky, Louisiana, Maryland, New Mexico, North Dakota, Ohio, Oklahoma, Tennessee.
- [e] Florida, Georgia, Maine, Massachusetts, Minnesota, Mississippi, Missouri, Nevada, New Hampshire, New Jersey, Pennsylvania South Dakota, Texas, Utah, Vermont, Wisconsin.
- [f] Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Kansas, New York, Oregon, Rhode Island, Washington, Wyoming.
- [g] Montana.

[4] The States represented by the numbers in this column are:
- [a] Nevada.
- [b] Utah.

Footnote [4]—Continued.
- [c] Idaho, Montana.
- [d] California, Colorado, New Mexico.
- [e] District of Columbia.
- [f] North Dakota, Texas.
- [g] Arkansas, Louisiana, Minnesota, Missouri, Oklahoma, Oregon, Tennessee, Washington.
- [h] Iowa, Kentucky, South Dakota, Vermont, West Virginia.
- [i] Florida, Illinois, Indiana, Nebraska, New Hampshire, Rhode Island.
- [j] Alabama, Kansas, Massachusetts, Mississippi, Wisconsin, Wyoming.
- [k] Connecticut, Georgia, Maine, Michigan, New York.
- [l] Arizona, New Jersey, Ohio, South Carolina, Virginia.
- [m] Maryland, North Carolina, Pennsylvania.
- [n] Delaware.

[5] The States represented by the numbers in this column are:
- [a] Montana, New Mexico.
- [b] Arizona.
- [c] Arkansas, Idaho, Mississippi, Nevada, Oregon, Washington.
- [d] Connecticut, Florida, Louisiana, Utah, Vermont.
- [e] Alabama, California, Colorado, Georgia, Indiana, Iowa, Massachusetts, Minnesota, Missouri, Nebraska, New Hampshire, North Dakota, Rhode Island, South Dakota, Wisconsin.
- [f] Illinois, Kansas, Maine, Maryland, Michigan, Ohio, Pennsylvania, South Carolina, Tennessee, Texas.
- [g] Delaware, Kentucky, New Jersey, New York, North Carolina, Oklahoma, West Virginia.
- [h] District of Columbia, Virginia.
- [i] Wyoming.

[6] The States represented by the numbers in this column are:
- [a] Arizona.
- [b] Montana, South Dakota, Utah.
- [c] Idaho, Nevada, New Mexico.
- [d] Arkansas, Colorado, Iowa, Louisiana, Minnesota, Nebraska.
- [e] Florida, Georgia, Mississippi, Missouri, North Dakota, Oregon, Texas, Vermont, Washington.
- [f] California, Kansas, New Hampshire, Wisconsin.
- [g] Illinois, Indiana, Maine, Massachusetts, South Carolina, Tennessee.
- [h] Alabama, Maryland, Oklahoma, Rhode Island, West Virginia.
- [i] Delaware, Michigan, New York, Ohio, Pennsylvania, Virginia.
- [j] District of Columbia, Kentucky, New Jersey, North Carolina, Wyoming.
- [k] Connecticut.

tables, the figures given in the left-hand column under each census year represent (in this case) the number of States in which manufacturing wage earners for all industries combined received per capita earnings bearing the indicated relationship to earnings in 1914. The percentages to the right show what proportion of all manufacturing wage earners were in these States. Thus, in 1899 in 24 States, employing 38 per cent of all manufacturing wage earners, real earnings were within 5 per cent of their level in 1914. In four States the per capita real earnings were between 10 and 15 per cent higher than they were in 1914. In 1904, in 21 of the 49 States (employing 67 per cent of the country's wage earners), real earnings were from 1 to 5 per cent higher than they were in 1914. In 1909, in 18 of the States (employing 30 per cent of all manufacturing wage earners), per

capita real earnings were between 1 and 10 per cent higher than they were in 1914. In 1921, in 17 of the States (employing 62 per cent of all manufacturing wage earners), per capita real earnings were between 1 and 10 per cent higher than per capita earnings in those same States in 1914, and in 2 States (employing 1 per cent of the wage earners) they were between 10 and 15 per cent higher. In 1923, in 24 States (employing 43 per cent of all manufacturing wage earners), real earnings per capita were from 20 to 40 per cent higher than in 1914.

The results given in Table 102 are compressed somewhat in Table 103 and put in a slightly different form to show the high, low, median, and decil State relatives of real earnings.

TABLE 103.—MEDIAN, DECIL, AND HIGH AND LOW STATE RELATIVES OF ESTIMATED REAL EARNINGS, PER CAPITA, IN EACH CENSUS YEAR: 1899–1923

[1914=100]

	1899	1904	1909	1914	1919	1921	1923
Highest relative	116	126	123	100	163	126	150
Ninth decil	111	110	115	100	138	107	145
Eighth decil	108	107	116	100	133	105	143
Seventh decil	103	105	114	100	129	100	136
Sixth decil	103	104	112	100	125	100	132
Median	99	103	110	100	120	99	125
Fourth decil	98	101	109	100	116	96	123
Third decil	97	100	108	100	113	95	121
Second decil	93	99	106	100	107	90	117
First decil	88	95	103	100	97	85	111
Lowest relative	82	84	94	100	84	78	104

Detailed figures for each of the 48 States and the District of Columbia are given in Table 104. The differences between the western, the northeastern, and the southern regions, already remarked upon, is confirmed by wide differences between the trends in the Western States, shown separately, and the individual States in the Northeast and South. In some States, especially in the West, there were declines in real earnings between 1899 and 1919. In Colorado, for example, the decrease was from 116 to 97. The District of Columbia experienced, apparently, the smallest increase (between 1899 and 1919) of any State in the East and South, with the possible exception of Texas, the real earnings in the District having been 103 in 1899 and 104 in 1919.

When the comparison runs between 1899 and 1923, however, the results are much more gratifying. Only two States, Montana and Arizona, saw lower real earnings per capita in 1923 than in 1899. Colorado showed only a very slight gain, her indices being 116 and 117 for 1899 and 1923, respectively. In most of the States the 1923 level of real earnings was considerably above that of 1899. Most of the States suffered declines both in the decade preceding the war

and in 1921. There was no 1921 slump in the District of Columbia, and the slump in 1921 was relatively slight, so far as regards losses in real earnings, in Utah and Nevada.

TABLE 104.—RELATIVE FLUCTUATIONS IN THE PURCHASING POWER (AT 1914 PRICE LEVEL) OF PER CAPITA MONEY EARNINGS IN THE UNITED STATES, ALL INDUSTRIES COMBINED, BY STATES, CENSUS YEARS: 1899–1923

[1914=100]

STATE	1899	1904	1909	1914	1919	1921	1923
United States	105	101	111	100	118	103	146
Maine	96	101	110	100	132	102	130
New Hampshire	103	101	110	100	122	96	128
Vermont	98	99	110	100	117	94	124
Massachusetts	110	103	113	100	125	96	133
Rhode Island	108	104	115	100	123	99	135
Connecticut	116	107	117	100	131	93	150
New York	107	103	115	100	130	106	143
New Jersey	110	104	114	100	137	105	149
Pennsylvania	109	104	113	100	142	100	144
Ohio	98	99	109	100	136	100	141
Indiana	98	95	104	100	124	99	133
Illinois	99	100	108	100	120	100	132
Michigan	82	84	94	100	131	100	141
Wisconsin	98	100	110	100	125	95	129
Minnesota	99	100	110	100	114	97	119
Iowa	89	90	103	100	116	97	119
Missouri	103	105	112	100	113	98	123
North Dakota	92	97	106	100	106	99	121
South Dakota	101	100	113	100	116	96	108
Nebraska	97	98	104	100	122	98	117
Kansas	104	104	115	100	125	103	126
Delaware	111	105	117	100	163	105	144
Maryland	99	97	107	100	142	104	136
District of Columbia	103	104	117	100	104	111	147
Virginia	100	99	103	100	136	112	144
West Virginia	88	96	104	100	117	107	139
North Carolina	83	92	104	100	142	105	147
South Carolina	82	85	103	100	138	101	132
Georgia	94	100	114	100	133	99	123
Florida	99	104	112	100	120	91	121
Kentucky	103	102	107	100	115	109	145
Tennessee	103	105	107	100	114	100	130
Alabama	94	101	109	100	127	95	135
Mississippi	103	115	112	100	128	88	120
Arkansas	93	110	108	100	113	86	115
Louisiana	101	110	108	100	112	90	116
Oklahoma	85	100	108	100	111	107	138
Texas	105	103	112	100	107	100	122
Montana	114	126	123	100	90	79	109
Idaho	89	99	98	100	94	85	111
Wyoming	109	110	118	100	129	126	145
Colorado	116	115	118	100	97	96	117
New Mexico	97	107	109	100	97	78	112
Arizona	116	113	117	100	135	80	104
Utah	94	101	113	100	86	90	106
Nevada	103	109	112	100	84	87	114
Washington	101	107	116	100	113	85	122
Oregon	93	105	119	100	113	86	121
California	97	104	119	100	97	96	126

The fluctuations in real earnings per capita in each of 18 cities are reported in Table 105. In all cities the 1923 level of real earnings was higher than that of 1899. But all of the cities witnessed more or less serious declines in real earnings either in the decade before the war or in the postwar depression of 1921, or in both these periods.

So far as can be ascertained from census year data, Los Angeles and San Francisco suffered no decline between 1919 and 1921. In St. Paul the pre-war slump apparently was relatively slight. In Detroit there does not appear to have been a pre-war slump in real earnings. There is not a single exception to the general increase in real earnings between 1921 and 1923.

TABLE 105.—RELATIVE FLUCTUATIONS IN THE PURCHASING POWER (AT 1914 PRICE LEVEL) OF ANNUAL MONEY EARNINGS, PER CAPITA, IN CERTAIN SELECTED CITIES, CENSUS YEARS: 1899–1923

[1914=100]

CITY	1899	1904	1909	1914	1919	1921	1923
United States	105	101	111	100	118	103	146
Baltimore	100	99	111	100	143	106	134
Boston	118	105	111	100	113	95	130
Buffalo	97	95	107	100	128	99	134
Los Angeles	93	108	117	100	90	91	125
Minneapolis	99	96	107	100	106	92	115
New York	115	106	118	100	135	114	150
Oakland	91	99	123	100	104	93	122
Philadelphia	111	104	111	100	138	106	147
Pittsburgh	112	105	111	100	134	98	138
San Francisco	96	101	123	100	92	92	118
St. Louis	104	105	115	100	109	96	123
St. Paul	85	93	106	100	107	100	121
Seattle	109	105	115	100	115	89	118
New Orleans	112	106	118	100	111	99	118
Chicago	99	101	107	100	121	103	135
Cincinnati	105	102	115	100	116	103	134
Cleveland	100	98	107	100	134	96	138
Detroit	78	82	93	100	138	111	149

PERCENTAGE CHANGES IN SELECTED INDUSTRIES

The remaining tables of this chapter, instead of presenting the results in the form of fixed base relatives, are built of link relatives showing the direction and degree of change in real earnings, either between one manufactures census year and the next, or, in the case of a dozen industries, between successive years. In Table 106 is presented a conspectus of such changes in real earnings. It has been constructed by arranging the 41 selected industries according to the direction and percentage of change between each successive census year. For example, in this table it is shown that between 1899 and 1904 in 14 industries (employing 29 per cent of all manufacturing wage earners) there was a decline in real earnings from 1899 to 1904 of between 5 and 10 per cent; in 9 industries (employing 14 per cent of all wage earners) there was during the same interval a decline in real earnings of between 1 and 5 per cent; in 7 industries (employing 8 per cent of the wage earners) there was an increase of between 1 and 5 per cent. These three groups make up, then, a majority of the 41 industries, so that in more than three-fourths of them the change between 1899 and 1904 was less than 10 per cent, either up or down. In one industry, employing in 1904 only one-third of 1 per

cent of all manufacturing wage earners, however, the per capita real earnings underwent a decline of between 20 and 25 per cent. On the other hand, in two industries (Woolen and worsted goods and Bread and other bakery products), employing 4 per cent of all manufacturing wage earners, real earnings per capita rose between 10 and 15 per cent. A footnote to the table lists the industries represented by each entry in the left-hand columns.[3]

TABLE 106.—THE 41 SELECTED INDUSTRIES AND THE WAGE EARNERS EMPLOYED THEREIN, DISTRIBUTED ACCORDING TO THE DIRECTION AND DEGREE OF CHANGE (FROM CENSUS-YEAR TO CENSUS-YEAR) IN THE PER CAPITA "REAL" EARNINGS PREVAILING IN EACH INDUSTRY

DIRECTION AND DEGREE OF CHANGE	THE NUMBER OF INDUSTRIES IN EACH DEGREE-OF-CHANGE GROUP AND PERCENTAGE BORNE BY THE AVERAGE NUMBER OF WAGE EARNERS IN THOSE INDUSTRIES TO TOTAL NUMBER OF WAGE EARNERS IN MANUFACTURING INDUSTRY													
	1899–1904*		1904–1909		1909–1914		1914–1919		1919–1921		1921–1923		1923–1925†	
	No.[1]	Per cent	No.[2]	Per cent	No.[3]	Per cent	No.[4]	Per cent	No.[5]	Per cent	No.[5]	Per cent	No.[7]	Per cent
Real earnings *rose*	10	13.81	35	57.98	4	2.36	31	56.44	19	22.65	41	69.48	15	26.46
Percentage of rise:														
85–89.9											[a] 1	3.39		
80–84.9														
75–79.9														
70–74.9											[b] 2	1.27		
65–69.9											[c] 2	2.72		
60–64.9											[d] 1	4.63		
55–59.9											[e] 1	.27		
50–54.9											[f] 2	1.18		
45–49.9							[a] 1	0.42			[g] 1	5.24		
40–44.9							[b] 1	3.53			[h] 4	9.95		
35–39.9							[e] 1	1.40			[i] 3	3.55		
30–34.9									[a] 1	1.32	[j] 4	3.51		
25–29.9			[a] 1	.39			[d] 3	1.98	[b] 1	1.35	[k] 5	5.48		
20–24.9	[a] 1	2.24	[b] 3	4.66			[e] 6	20.48			[l] 3	5.33		
15–19.9			[c] 4	6.93			[f] 4	10.67	[c] 1	.25	[m] 8	17.51		
10–14.9	[b] 2	3.95	[d] 15	33.29	[a] 1	(‡)	[g] 2	3.94	[d] 2	3.39	[n] 1	.88		
5–9.9			[e] 9	11.14	[b] 2	1.69	[h] 8	9.91	[e] 9	11.42	[o] 2	4.06	[e] 6	8.56
Under 5	[a] 7	7.62	[f] 3	1.57	[a] 1	.67	[i] 5	4.11	[f] 5	4.92	[p] 1	.51	[b] 9	17.90
Percentage of fall:														
Under 5	[d] 9	13.59	[g] 3	5.18	[d] 10	14.13	[j] 7	9.10	[g] 2	5.76			[g] 9	13.20
5–9.9	[e] 14	29.32	[h] 2	9.91	[c] 12	26.05	[h] 2	1.85	[h] 5	5.98			[d] 10	23.89
10–14.9	[f] 5	13.49	[i] 1	1.17	[f] 11	18.45	[j] 1	.88	[i] 4	8.25			[g] 4	5.90
15–19.9					[g] 4	13.67			[r] 3	5.71				
20–24.9	[g] 1	.26							[h] 4	14.37				
25–29.9									[j] 1	.57			[f] 1	.68
30–34.9									[m] 2	.87				
35–39.9									[n] 1	4.12				
Real earnings *fell*	29	56.66	6	16.29	37	72.30	10	11.83	22	45.63			24	43.67
Total	39	70.47	41	74.27	41	74.66	41	68.27	41	68.28	41	69.48	39	70.13
Not covered in this table		29.53		25.73		25.34		31.73		31.72		30.52		29.87
Total wage earners, all manufacturing industries, number	4,712,763		5,468,383		6,615,016		7,036,247		9,096,372		8,778,173		8,384,261	

*Only 39 industries reported for 1899, data for "Automobile bodies and parts" and "Chemicals" being unavailable.

†Only 39 industries reported for 1925, data for "Liquors, malt," and "Mineral and soda waters" being unavailable.

‡Automobiles included in "Automobiles, bodies and parts."

[3] Compare Table 26 and Figure 11, which are based on the same set of link relatives as Table 106.

(See pp. 213 and 214 for footnotes to table.)

[1] The industries represented by the figures in this column are:
- [a] Brick and tile, pottery, terra-cotta, and fire-clay products.
- [b] Bread and other bakery products; Woolen and worsted goods.
- [c] Liquors, malt; Lumber planing-mill products, not including planing mills connected with sawmills; Mineral and soda waters; Paper and wood pulp; Printing and publishing, newspapers and periodicals; Slaughtering and meat packing; Smelting and refining, copper, lead, and zinc.
- [d] Boots and shoes, not including rubber boots and shoes; Cars, steam-railroad, not including operations of railroad companies; Clothing, men's; Clothing, women's; Flour-mill and gristmill products; Furniture; Glass; Printing and publishing, book and job; Rubber tires, tubes, and rubber goods, not elsewhere specified.

  Agricultural implements; Carpets and rugs, other than rag; Cars and general shop construction and repairs by steam-railroad companies; Confectionery; Cotton manufactures; Electrical machinery, apparatus, and supplies; Foundry and machine-shop products; Iron and steel, blast furnaces; Leather, tanned, curried, and finished; Knit goods; Shipbuilding, steel; Shirts; Silk goods, including throwsters; Tobacco, cigars and cigarettes.
- [f] Automobiles; Cars and general shop construction and repairs by electric-railroad companies; Dyeing and finishing textiles, exclusive of that done in textile mills; Iron and steel, steel works and rolling mills; Lumber and timber products.
- [g] Petroleum refining.

[2] The industries represented by the figures in this column are:
- [a] Rubber tires, tubes, and rubber goods not elsewhere specified.
- [b] Automobiles, bodies and parts; Iron and steel, blast furnaces; Iron and steel, steel works and rolling mills.
- [c] Clothing, women's; Shipbuilding, steel; Silk goods, including throwsters; Woolen and worsted goods.
- [d] Agricultural implements; Automobiles; Brick and tile, pottery, terra-cotta, and fire-clay products; Carpets and rugs, other than rag; Cars and general shop construction and repairs by steam-railroad companies; Clothing, men's; Cotton manufactures; Dyeing and finishing textiles, exclusive of that done in textile mills; Electrical machinery, apparatus, and supplies; Foundry and machine-shop products; Knit goods; Printing and publishing, newspapers and periodicals; Printing and publishing, book and job; Paper and wood pulp; Shirts.
- [e] Boots and shoes, not including rubber boots and shoes; Bread and other bakery products; Cars and general shop construction and repairs by electric-railroad companies; Cars, steam-railroad, not including operations of railroad companies; Confectionery; Furniture; Leather, tanned, curried, and finished; Lumber, planing-mill products, not including planing mills connected with sawmills; Petroleum refining.
- [f] Chemicals; Flour-mill and gristmill products; Smelting and refining, copper, lead, and zinc.
- [g] Liquors, malt; Slaughtering and meat packing; Tobacco, cigars, and cigarettes.
- [h] Lumber and timber products; Mineral and soda waters.
- [i] Glass.

[3] The industries represented by the figures in this column are:
- [a] Automobiles.
- [b] Cars, steam-railroad, not including operations of railroad companies; Glass.
- [c] Confectionery.

Footnote [3]—Continued.
- [d] Agricultural implements; Automobiles, bodies and parts; Chemicals; Cotton manufactures; Knit goods; Liquors, malt; Mineral and soda waters; Petroleum refining; Shipbuilding, steel; Tobacco, cigars and cigarettes.
- [e] Clothing, men's; Flour-mill and gristmill products; Furniture; Lumber, planing-mill products, not including planing mills connected with sawmills; Lumber and timber products; Paper and wood pulp; Printing and publishing, book and job; Printing and publishing, newspapers and periodicals; Rubber tires, tubes, and rubber goods not elsewhere specified; Shirts; Silk goods, including throwsters; Slaughtering and meat packing.
- [f] Boots and shoes, not including rubber boots and shoes; Brick and tile, pottery, terra-cotta, and fire-clay products; Clothing, women's; Dyeing and finishing textiles, exclusive of that done in textile mills; Electrical machinery, apparatus, and supplies; Cars and general shop construction and repairs by electric-railroad companies; Iron and steel, blast furnaces; Leather, tanned, curried, and finished; Smelting and refining, copper, lead, and zinc; Woolen and worsted goods; Cars and general shop construction and repairs by steam-railroad companies.
- [g] Bread and other bakery products; Carpets and rugs, other than rag; Foundry and machine-shop products.

[4] The industries represented by the figures in this column are:
- [a] Iron and steel, blast furnaces.
- [b] Iron and steel, steel works and rolling mills.
- [c] Slaughtering and meat packing.
- [d] Leather, tanned, curried, and finished; Rubber tires, tubes, and rubber goods, not elsewhere specified; Shipbuilding, steel.
- [e] Carpets and rugs, other than rag; Cars and general shop construction and repairs by steam-railroad companies; Cars, steam-railroad, not including operations of railroad companies; Clothing, men's; Foundry and machine-shop products; Lumber and timber products.
- [f] Brick and tile, pottery, terra-cotta, and fire-clay products; Clothing, women's; Cotton manufactures; Paper and wood pulp.
- [g] Electrical machinery, apparatus, and supplies; Woolen and worsted goods.
- [h] Boots and shoes not including rubber boots and shoes; Bread and other bakery products; Dyeing and finishing textiles, exclusive of that done in textile mills; Flour-mill and gristmill products; Furniture; Chemicals; Petroleum refining; Silk goods.
- [i] Agricultural implements; Automobiles, bodies and parts; Cars and general shop construction and repairs by electric-railroad companies; Confectionery; Printing and publishing, book and job.
- [j] Automobiles; Glass; Knit goods; Lumber, planing-mill products, not including planing mills connected with sawmills; Shirts; Smelting and refining, copper, lead, and zinc; Tobacco, cigars and cigarettes.
- [k] Mineral and soda waters; Printing and publishing, newspapers and periodicals.
- [l] Liquors, malt.

[5] The industries represented by the figures in this column are:
- [a] Printing and publishing, newspapers and periodicals.
- [b] Printing and publishing, book and job.
- [c] Carpets and rugs other than rag.
- [d] Bread and other bakery products; Woolen and worsted goods.
- [e] Clothing, men's; Clothing, women's; Confectionery; Dyeing and finishing textiles, exclusive of that done in textile mills; Furniture; Knit goods; Lumber, planing-mill products, not including planing mills connected with sawmills; Shirts; Silk goods, including throwsters.

Footnote [5]—Continued.

[f] Boots and shoes, not including rubber boots and shoes; Flour-mill and gristmill products; Liquors, malt; Mineral and soda waters; Tobacco, cigars and cigarettes.
[g] Cotton manufactures; Glass.
[h] Agricultural implements; Brick and tile, pottery, terra-cotta, and fire-clay products; Electrical machinery, apparatus, and supplies; Paper and wood pulp; Petroleum refining; Woolen and worsted goods.
[i] Cars and general shop construction and repairs by electric-railroad companies; Cars and general shop construction and repairs by steam-railroad companies; Leather, tanned, curried, and finished; Slaughtering and meat packing.
[j] Chemicals; Rubber tires, tubes, and rubber goods not elsewhere specified; Shipbuilding, steel.
[k] Automobiles; Automobiles, bodies and parts; Foundry and machine-shop products; Lumber and timber products.
[l] Cars, steam-railroad, not including operations of railroad companies.
[m] Iron and steel, blast furnaces; Smelting and refining, copper, lead, and zinc.
[n] Iron and steel, steel works and rolling mills.

[6] The industries represented by the figures in this column are:

[a] Iron and steel, steel works, and rolling mills.
[b] Automobiles, bodies and parts; Smelting and refining, copper, lead, and zinc.
[c] Automobiles; Cars, steam-railroad, not including operations of railroad companies.
[d] Foundry and machine-shop products.
[e] Iron and steel, blast furnaces.
[f] Cars and general shop construction and repairs by electric-railroad companies; Leather, tanned, curried, and finished.
[g] Lumber and timber products.
[h] Brick and tile, pottery, terra-cotta, and fire-clay products; Cars and general shop construction and repairs by steam-railroad companies; Electrical machinery, apparatus, and supplies; Rubber tires, tubes and rubber goods, not elsewhere specified.
[i] Chemicals; Furniture; Lumber, planing-mill products, not including planing mills connected with sawmills.
[j] Agricultural implements; Mineral and soda waters; Paper and wood pulp; Shipbuilding, steel.
[k] Carpets and rugs, other than rag; Glass; Liquors, malt; Silk goods, including throwsters; Woolen and worsted goods.

Footnote [6]—Continued.

[l] Clothing, women's; Knit goods; Petroleum refining.
[m] Boots and shoes, not including rubber boots and shoes; Clothing, men's; Cotton manufactures; Dyeing and finishing textiles, exclusive of that done in textile mills; Printing and publishing, book and job; Printing and publishing, newspapers and periodicals; Shirts; Slaughtering and meat packing.
[n] Confectionery.
[o] Bread and other bakery products; Tobacco, cigars and cigarettes.
[p] Flour-mill and gristmill products.

[7] The industries represented by the figures in this column are:

[a] Automobiles, bodies and parts; Confectionery; Furniture; Lumber, planing-mill products, not including planing mills connected with sawmills; Printing and publishing, newspapers and periodicals; Rubber tires, tubes, and rubber goods not elsewhere specified.
[b] Automobiles; Bread and other bakery products; Chemicals; Electrical machinery, apparatus, and supplies; Flour-mill and gristmill products; Lumber and timber products; Petroleum refining; Printing and publishing, book and job; Tobacco, cigars and cigarettes.
[c] Agricultural implements; Brick and tile, pottery, terra-cotta, and fire-clay products; Cars and general shop construction and repairs by electric-railroad companies; Foundry and machine shop products; Glass; Paper and wood pulp; Shipbuilding, steel; Silk goods, including throwsters; Slaughtering and meat packing.
[d] Boots and shoes, not including rubber boots and shoes; Carpets and rugs, other than rag; Cars and general shop construction and repairs by steam-railroad companies; Clothing, women's; Cotton manufactures; Dyeing and finishing textiles, exclusive of that done in textile mills; Iron and steel, blast furnaces; Iron and steel, steel works and rolling mills; Knit goods; Smelting and refining, copper, lead, and zinc.
[e] Cars, steam-railroad, not including operations of railroad companies; Clothing, men's; Shirts; Woolen and worsted goods.
[f] Leather, tanned, curried, and finished.

Between 1904 and 1909 in 15 industries (employing 33 per cent of all wage earners) real earnings rose between 10 and 15 per cent. Between 1909 and 1914 in 22 industries (employing 40 per cent of all wage earners) real earnings fell between 1 and 10 per cent; but in 3 industries (employing slightly more than 2 per cent of all wage earners) earnings rose between 1 and 10 per cent. Between 1914 and 1919, in 12 industries (employing 35 per cent of all manufacturing wage earners) real earnings rose between 10 and 25 per cent. Between 1919 and 1921, in 14 industries (employing 26 per cent of all wage earners) real earnings fell from 1 to 20 per cent; in 14 industries (employing 16 per cent of all wage earners) earnings rose from 1 to 10 per cent. Between 1921 and 1923 in 15 industries (employing 18 per cent of the wage earners) real earnings rose from 20 to 40 per cent; not a single industry showed a decline in per capita real earn-

ings between 1921 and 1923. Between 1923 and 1925, in 19 industries, employing 37 per cent of the wage earners, real earnings fell from 1 to 10 per cent, and in 15 industries, employing 26 per cent of the workers, they rose in the same proportions. There were no industry changes upward in this last biennial period greater than 10 per cent.

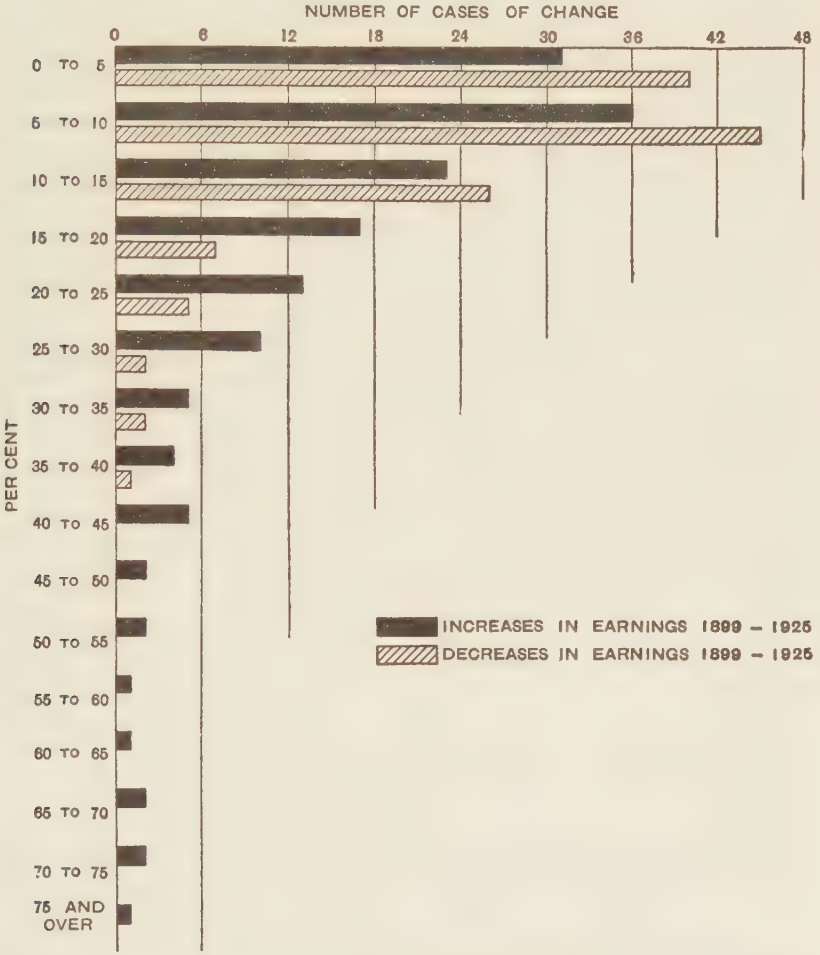


FIG. 27.—DISTRIBUTION OF 283 CASES OF CENSUS YEAR TO CENSUS YEAR CHANGES IN REAL LABOR INCOME, PER CAPITA, IN 41 SELECTED INDUSTRIES, 1899–1925

In 4 industries, however, real earnings fell between 10 and 15 per cent, and in 1 industry (leather) they fell between 25 and 30 per cent.

A summary of the distribution given in Table 106, showing the pre-war and postwar periods separately, is given in Table 107, whose data are charted in Figure 27. There is evident again here, as in

earlier tables of a similar sort, a greater degree of variation as between industries in the later than in the earlier period. The summary given in the last column, for the whole period from 1899 to 1925, shows a very pronounced degree of concentration, especially within the two lowest brackets of increase and decrease; that is to say, the great bulk of the changes which took place in real earnings between census years were changes amounting to less than 10 per cent. Of course, it is quite possible that we are overlooking intercensal changes not indicated in the table, which may easily minimize the degree of change shown, due to the cancellation of changes in intercensal years. Table 109, on page 219, with Figure 28, covering a small group of selected industries, shows changes for each year from 1899 to 1927 and serves to throw some light on this question.

TABLE 107.—DISTRIBUTION OF 121 CASES OF CENSUS YEAR TO CENSUS YEAR (INDUSTRY) CHANGES IN "REAL" EARNINGS FOR THE PERIOD 1899 TO 1914, COMPARED WITH SIMILAR DISTRIBUTION OF 162 CASES FOR THE PERIOD 1914–1925

[Based on link relatives for the 41 selected industries]

PER CENT OF CHANGE FROM PER CAPITA REAL EARNINGS OF THE PRECEDING CENSUS YEAR.	NUMBER OF CASES			PER CENT OF CHANGE FROM PER CAPITA REAL EARNINGS OF THE PRECEDING CENSUS YEAR	NUMBER OF CASES		
	1899–1914	1914–1923	1899–1923		1899–1914	1914–1925	1899–1925
Increases:				Decreases:			
85–89.9	-------	1	1	Under 5	22	18	40
70–74.9	-------	2	2	5–9.9	28	17	45
65–69.9	-------	2	2	10–14.9	17	9	26
60–64.9	-------	1	1	15–19.9	4	3	7
55–59.9	-------	1	1	20–24.9	1	4	5
50–54.9	-------	2	2	25–29.9	-------	2	2
45–49.9	-------	2	2	30–34.9	-------	2	2
40–44.9	-------	5	5	35–39.9	-------	1	1
35–39.9	-------	4	4				
30–34.9	-------	5	5	Total cases	121	162	283
25–29.9	1	9	10				
20–24.9	4	9	13	Increases	49	106	155
15–19.9	4	13	17	Decreases	72	56	128
10–14.9	18	5	23				
5–9.9	11	25	36				
Under 5	11	20	31				

Percentages of change in real earnings are shown in Table 108 for each of the 41 selected industries, for each interval from census year to census year up to and including 1923. It will be noticed that by no means all industries shared in the general decline between 1919 and 1921, nor did all industries participate in the increase of earnings which generally characterized the period from 1914 to 1919. Every industry did participate, however, in the increase between 1921 and 1923. Between 1919 and 1921, in the two divisions of the printing and publishing industry there were increases of 28.8 and 33.4 per cent, respectively. In the malt liquor industry, between 1914 and 1919, there was a decline of 12.1 per cent in per capita real earnings; on the other hand, the greatest percentage of increase (1914–1919) was apparently achieved by the blast-furnace division of the iron and

steel industry, where the increase was 46 per cent. That industry, moreover, was among those suffering the greatest declines in earnings between 1919 and 1921; indeed it was only exceeded in point of degree of decline by the other division of the iron and steel industry,

TABLE 108.—PERCENTAGE OF CHANGE IN ANNUAL "REAL" EARNINGS, PER CAPITA, FROM ONE CENSUS YEAR TO THE NEXT, FOR THE UNITED STATES, BY SELECTED INDUSTRIES: 1899–1925

INDUSTRY	PER CENT OF CHANGE FROM—						
	1899–1904	1904–1909	1909–1914	1914–1919	1919–1921	1921–1923	1923–1925
All industries	−3.5	10.0	−10.0	17.5	−12.1	41.0	−1.7
Bread and other bakery products	13.6	7.3	−16.5	9.3	11.1	5.7	.7
Flour-mill and gristmill products	−.3	3.3	−8.7	8.9	1.8	3.9	.9
Confectionery	−6.4	7.7	2.2	2.2	7.0	13.4	7.0
Slaughtering and meat packing	4.4	−2.0	−9.7	35.2	−12.4	18.3	−3.6
Liquors, malt	1.9	−2.7	−.9	−12.1	4.0	27.3	-------
Mineral and soda waters	1.6	−7.5	−1.2	−5.5	2.7	33.4	-------
Tobacco, cigars and cigarettes	−5.3	−2.3	−4.0	−4.1	.6	9.8	2.7
Carpets and rugs, other than rag	−6.7	13.0	−15.2	22.1	15.7	27.4	−9.1
Shirts	−8.7	11.8	−9.8	−4.2	9.7	16.6	−11.5
Clothing, men's	−2.6	12.7	−9.6	22.1	5.4	15.0	−12.3
Clothing, women's	−.4	15.8	−10.1	16.9	6.0	20.7	−5.2
Cotton manufactures	−7.4	12.9	−3.8	17.4	−4.1	15.4	−7.4
Dyeing and finishing textiles, exclusive of that done in textile mills	−10.6	10.8	−10.5	8.2	8.4	18.1	−5.8
Knit goods	−8.4	13.8	−3.1	−1.1	9.9	23.3	−5.1
Silk goods, including throwsters	−7.7	15.7	−5.6	6.5	6.6	25.6	−3.0
Woolen and worsted goods	14.0	16.8	−13.4	11.8	12.4	26.7	−13.5
Boots and shoes, not including rubber boots and shoes	−3.1	8.9	−11.1	7.9	2.6	16.3	−9.8
Leather, tanned, curried, and finished	−5.3	9.9	−11.3	28.6	−13.3	50.8	−27.3
Furniture	−1.6	9.5	−9.8	8.1	5.7	35.9	6.6
Lumber and timber products	12.0	−6.5	−6.5	22.1	−21.3	45.0	3.8
Lumber, planing-mill products, not including planing mills connected with sawmills	4.3	7.1	−8.0	−2.6	8.9	35.6	6.2
Paper and wood pulp	.7	10.2	−8.2	16.6	−7.8	30.9	−3.8
Printing and publishing, book and job	−2.9	10.3	−8.1	.1	28.8	18.4	.9
Printing and publishing, newspapers and periodicals	.6	10.2	−7.5	−6.8	33.4	18.8	5.5
Chemicals	-------	1.4	−1.7	9.5	−17.0	38.1	1.0
Petroleum refining	−20.5	9.2	−2.7	9.7	−7.5	24.8	.7
Brick and tile, pottery, terra-cotta, and fire-clay products	21.7	10.3	−14.7	17.3	−5.7	42.4	−.7
Glass	−2.4	−12.5	9.6	−1.1	−3.9	29.3	−1.4
Iron and steel, blast furnaces	−5.4	24.4	−10.5	46.0	−33.7	59.0	−9.4
Iron and steel, steel works and rolling mills	−12.4	20.9	−17.5	43.4	−39.5	85.8	−5.6
Foundry and machine-shop products	−8.8	12.4	−17.5	20.2	−22.6	63.5	−1.2
Smelting and refining, copper, lead, and zinc	.9	2.0	−12.6	−2.1	−30.4	74.4	−7.3
Automobile bodies and parts	-------	22.3	−2.4	1.5	−22.6	70.5	8.3
Automobiles	−12.8	11.7	10.0	−3.1	−22.1	69.6	4.3
Cars, steam-railroad, not including operations of railroad companies	−4.8	5.4	8.4	23.4	−25.1	66.2	−10.0
Railroad repair shops—electric	−12.3	5.1	−12.3	4.6	−14.2	52.6	−.6
Railroad repair shops—steam	−6.7	11.5	−14.3	21.5	−14.8	42.0	−7.2
Agricultural implements	−6.3	13.6	−1.3	4.9	−8.3	32.1	−2.8
Rubber goods	−4.4	27.6	−8.9	28.6	−16.8	40.3	6.9
Shipbuilding, steel	−7.3	15.0	−4.8	27.7	−19.2	32.1	−1.6
Electrical machinery, apparatus, and supplies	−7.1	13.6	−13.8	10.2	−7.8	42.6	1.1

where the decline was 39.5 per cent. The increases in real earnings between 1921 and 1923 ranged from 3.9 per cent in flour-mill and gristmill products to 85.8 per cent in steel works and rolling mills. Between 1923 and 1925 most of the changes were downward, but not

heavily so. The heaviest decline was in leather manufacture, 27.3 per cent. The greatest increase was one of 8.3 per cent, in automobile bodies and parts.

ANNUAL PERCENTAGES OF CHANGE IN 12 INDUSTRIES

Link relatives of real earnings for the 12 industries for which it has been possible to interpolate the intercensal years are reported in Table 109. The data of the table are plotted on a semilogarithmic scale in Figure 28, which is constructed in very much the same way as Figure 11. As in the earlier graph there is no fixed base and the slope of the lines is proportionate to the degree of change indicated by the data. In Figure 28 the dots on the vertical lines, 13 in number, represent, not, as they do in Figure 11, only the median, decil, and extreme industry cases of change, but each of the (12) industry cases, separately reported, in addition to the group described as "all industries," which includes all the industries reported by the census of manufactures. Each of the sloping, dotted lines, as indicated on the graph, represents 1 of the 12 industries reported in Table 109. The solid, black line represents the median industry group. This median line is not necessarily the "all industries line." The latter is made a heavy dotted line in all cases where it is not the median. In a general way, the fanning out of the industry lines gives a fairly good idea of the spread and concentration of single industries above and below the general trend for manufacturing industry as a whole. It also indicates the widely variant degrees of change in earnings in different industries. The extreme industry cases are labeled with the names of the industries to which they apply.

It would seem from an examination of these figures that the data of preceding tables, showing census year to census year changes, can be fairly well relied upon. There are, however, important exceptions, such, for example, as the changes between 1914 and 1919 in all industries combined, where we have, lurking behind the quinquennial census figure of 17.5 per cent rise between 1914 and 1915, a change of 7.6 per cent up, followed in the next year by a change of 15.8 per cent up, followed in the next year by a change of 7.1 per cent down, followed by a change of 5 per cent up, and that, finally, by a change of 5.4 per cent up. These changes are indicated in the census year to census year link relatives by the single figure +17.5 per cent, which, of course, falls far short of revealing all the facts. It may be noted that the maximum year-to-year increase, namely, the increase of 46.7 per cent between 1915 and 1916 in the woolen industry, is not indicated at all in our figures for census years, there being in the latter series of figures no greater increase shown in the woolen industry than 26.7 per cent (1909–1914). It is evident, therefore, that

TABLE 109.—YEAR TO YEAR CHANGES IN PURCHASING POWER OF ACTUAL LABOR INCOMES, PER CAPITA, ALL INDUSTRIES COMBINED, AND 12 SELECTED INDUSTRIES: 1899–1927

[Unit, 1 per cent]

PERIOD	All manufacturing industries [1]	Woolen goods	Cotton manufactures	Silk goods	Knit goods	Clothing, mens'	Boots and shoes
Code number	0	1	2	3	4	5	6
1899–1900	−2.0	+.0	4.2	−0.4	−2.3	−0.9	−4.0
1900–1901	2.2	22.2	−2.1	−3.2	−3.1	−1.3	2.1
1901–1902	2.8	−1.0	2.6	11.8	−1.0	1.6	2.9
1902–1903	−4.5	−8.2	−2.3	−2.0	−3.8	−5.5	−4.8
1903–1904	−1.9	2.6	−9.5	−4.0	1.5	3.7	1.0
1904–1905	11.0	15.0	−.7	7.6	47.8	3.7	5.6
1905–1906	2.2	12.3	8.4	−1.2	−29.6	.9	1.6
1906–1907	−3.6	−1.1	7.7	3.1	−4.4	−3.7	−.4
1907–1908	−10.4	−11.8	2.8	−.6	−12.1	1.5	3.9
1908–1909	12.3	3.6	−5.3	6.2	29.8	10.2	−2.0
1909–1910	−5.0	−5.1	−5.4	−5.6	−2.4	6.0	−4.5
1910–1911	−7.6	−3.6	−4.1	−1.5	−1.5	3.9	−3.1
1911–1912	9.8	3.0	7.9	.3	2.8	−3.6	−.6
1912–1913	1.0	−8.7	3.2	3.7	−2.2	−.6	−2.4
1913–1914	−7.5	.6	−4.8	−2.4	.2	−14.4	−1.1
1914–1915	7.6	4.2	−1.2	4.2	3.4	4.2	.9
1915–1916	15.8	46.7	11.4	19.4	19.3	18.6	12.3
1916–1917	−7.1	−15.0	.7	−6.8	−8.2	.9	4.3
1917–1918	5.4	1.1	16.3	1.8	3.7	3.3	6.5
1918–1919	−3.7	−15.0	−9.0	−9.8	−15.7	−5.2	−14.2
1919–1920	7.2	2.8	6.0	.7	2.9	6.4	−5.1
1920–1921	−18.0	9.3	−9.5	5.9	6.8	−.9	8.0
1921–1922	18.5	7.8	3.0	+.0	7.8	6.9	11.2
1922–1923	17.0	17.3	12.0	25.6	14.3	7.5	4.6
1923–1924	−7.5	−12.7	−4.8	−16.9	−12.6	−9.1	−13.2
1924–1925	6.0	−.9	−2.8	16.8	8.7	−3.5	3.9
1925–1926	1.0	−1.5	−1.7	−1.3	2.4	−4.2	−2.4
1926–1927	−2.5	2.2	4.3	2.0	4.5	.6	1.0

PERIOD	Automobiles	Iron and steel, steel works	Cars, steam-railroad	Paper and wood pulp	Tobacco, cigars and cigarettes	Leather, tanned
Code number	7	8	9	10	11	12
1899–1900	[2] −1.7	3.2	7.3	1.3	0.2	1.2
1900–1901	[2] 1.8	−24.7	1.7	−1.8	−3.4	−3.4
1901–1902	[2] 3.1	7.0	7.8	2.3	3.1	−2.8
1902–1903	[2] −4.5	−5.8	−7.8	−5.7	−5.7	−1.6
1903–1904	[2] −11.4	11.8	−12.3	4.8	.5	1.3
1904–1905	[2] 11.0	17.9	20.0	2.0	−.7	+.0
1905–1906	[2] 2.1	−3.1	−9.9	3.2	−3.0	18.7
1906–1907	[2] 5.0	2.2	−3.2	−2.8	−2.4	−7.1
1907–1908	1.3	−19.9	−7.1	−5.3	5.7	.2
1908–1909	−7.3	29.3	8.3	13.8	−1.6	−.5
1909–1910	7.9	−2.6	−14.8	−4.5	−3.4	−4.8
1910–1911	−10.0	−.3	22.6	−2.2	−1.5	−1.9
1911–1912	−4.0	2.6	12.8	.8	1.0	−2.0
1912–1913	6.6	−3.9	−2.2	−2.1	+.0	−1.1
1913–1914	10.7	−13.9	−6.0	−.5	+.0	−2.0
1914–1915	[2] −10.2	8.0	−20.4	−.5	−7.2	3.2
1915–1916	[2] −3.9	36.7	3.8	11.9	16.5	19.9
1916–1917	[2] 17.6	−3.6	19.0	−9.8	5.2	−13.5
1917–1918	−18.7	1.8	−4.4	3.1	−10.1	9.5
1918–1919	17.4	−1.0	31.2	12.6	−6.3	9.6
1919–1920	10.5	10.6	15.3	19.8	16.0	−13.3
1920–1921	−29.5	−45.3	−35.1	−23.1	−13.3	+.0
1921–1922	43.9	28.8	15.8	19.8	6.3	19.4
1922–1923	17.9	44.3	43.5	9.2	3.3	26.3
1923–1924	7.6	−12.5	−25.8	−2.2	−11.6	−20.7
1924–1925	−3.1	7.9	21.3	−1.7	16.2	−8.3
1925–1926	−5.0	−.2	−.4	.2	.5	−.6
1926–1927	.1	−.6	3.4	.1	+.0	+.0

[1] Including all manufacturing industries reported by the census.
[2] Derived from data for all industries combined.
[3] Based on Massachusetts data on automobiles.

CONSPECTUS OF YEAR TO YEAR CHANGES IN REAL INCOME

FIG. 28A

IN EACH OF 12 SELECTED INDUSTRIES: 1899–1927

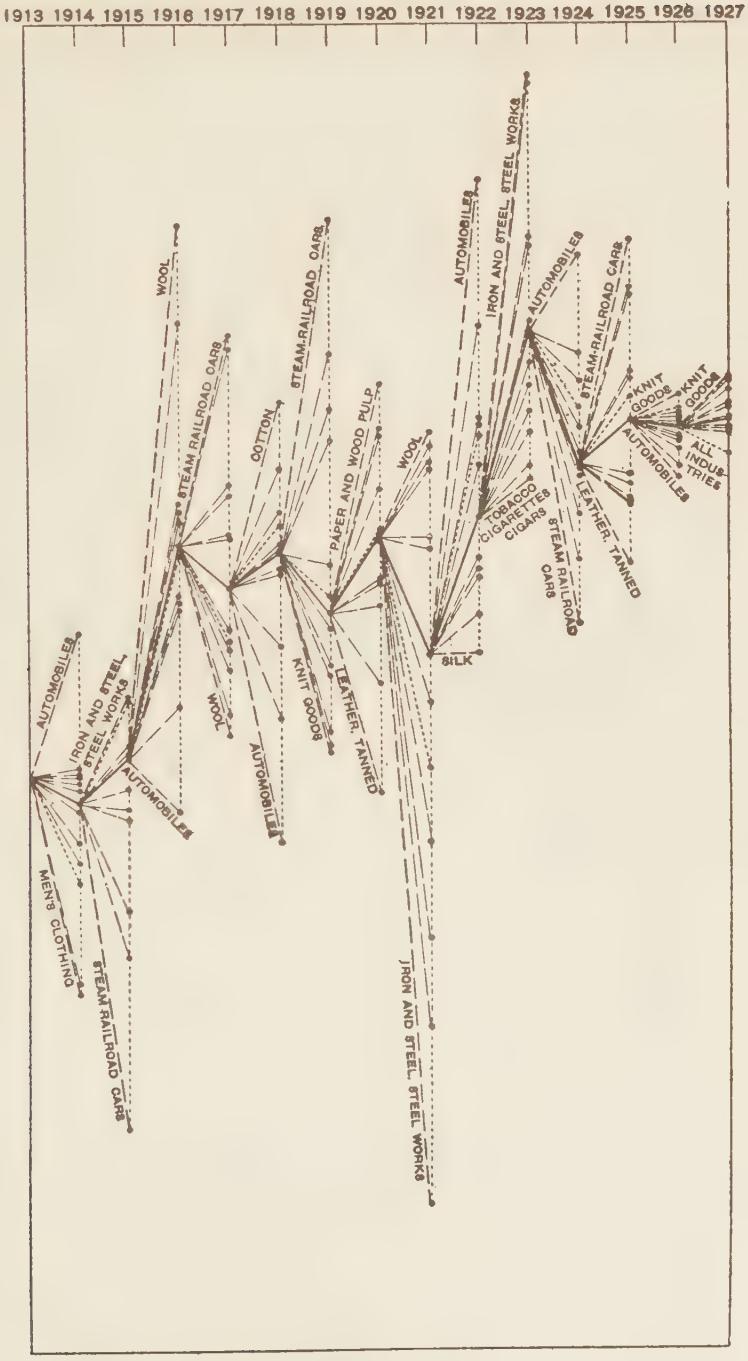


FIG. 28B

the year-to-year change series is likely to be more reliable than a series wherein only census years are shown, especially for those parts of the period when the census years are five years apart.

A simple distribution of the 336 cases of year-to-year changes in real earnings, shown in Table 109, is given in Table 110, the data of which are shown in graphic form in Figure 29. This summary

TABLE 110.—DISTRIBUTION OF 336 CASES OF YEAR-TO-YEAR CHANGE IN REAL EARNINGS, IN 12 SELECTED INDUSTRIES, AND ALL MANUFACTURING INDUSTRIES COMBINED: 1899–1927

PER CENT OF CHANGE FROM PER CAPITA REAL EARNINGS OF PRECEDING YEAR	Number of cases	PER CENT OF CHANGE FROM PER CAPITA REAL EARNINGS OF PRECEDING YEAR	Number of cases
Increases:		Decreases:	
45–49.9	2	Under 5	91
40–44.9	3	5–9.9	32
35–39.9	1	10–14.9	18
30–34.9	1	15–19.9	6
25–29.9	5	20–24.9	4
20–24.9	4	25–29.9	3
15–19.9	22	30–34.9	
10–14.9	18	35–39.9	1
5–9.9	35	45–49.9	1
Under 5	81	No change	8
		Total cases	336
		Increases	172
		Decreases	156

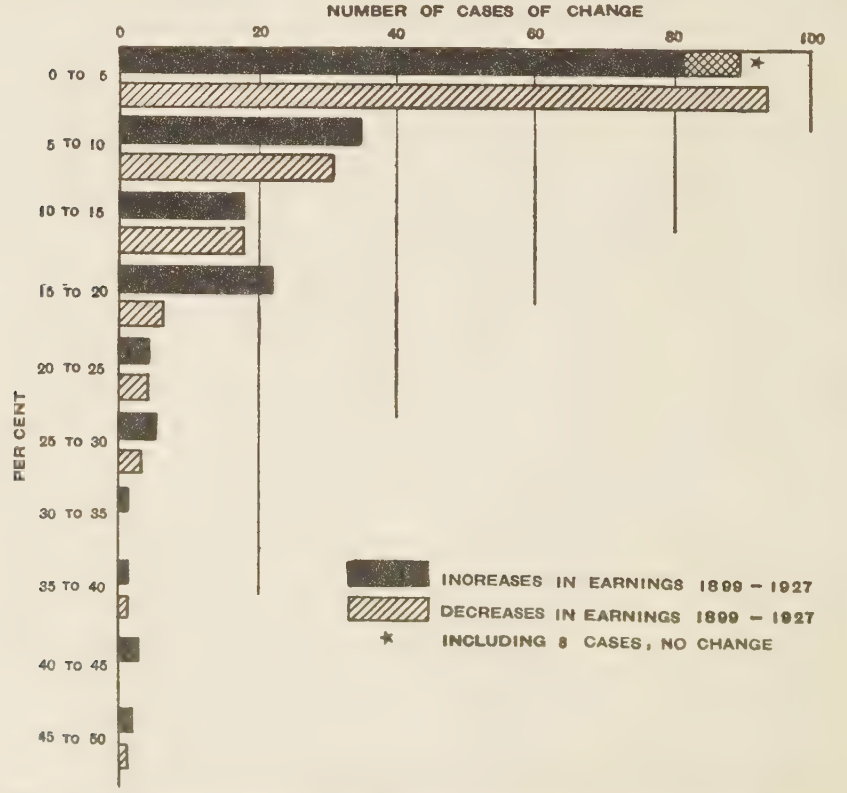


FIG. 29.—DISTRIBUTION OF 336 CASES OF YEAR TO YEAR CHANGE IN REAL LABOR INCOMES, PER CAPITA, IN 12 SELECTED INDUSTRIES: 1899–1927

shows that although there is a considerable degree of concentration around those changes which are less than 10 per cent in either direction, this concentration probably is not so great as appeared to be indicated by the figures given in Table 107.

PERCENTAGE CHANGES IN THE DIFFERENT STATES

The distribution of the 48 States with respect to census year to census year changes in real earnings is indicated in Table 111. It is very evident from this distribution of State changes that there is no less variation among States than among industries. Especially heavy concentration seems to occur in the period between 1904 and 1909, in which interval there were 21 States (employing 55.9 per cent of all manufacturing wage earners) in which the per capita earnings for all industries combined recorded increases ranging between 5 and 10 per cent. In the interval between 1919 and 1921 there were 20 States (employing 60.7 per cent of all wage earners) in which per capita real earnings suffered declines of from 20 to 30 per cent. In the preceding period, one of distinctly opposite and bullish tendencies, there were 26 States (employing 53.9 per cent of all wage earners) in which per capita real earnings increased from 10 to 30 per cent. In the biennial census period 1921–1923 there were 15 States (employing 48.1 per cent of the wage earners) in which increases in real earnings ranged between 35 to 45 per cent. Names of the States in the different groups are given in the lettered footnotes to the table.

Table 112 gives the distribution of 294 cases of State change in real earnings, showing pre-war and postwar periods separately, and, in general, reinforces the conclusions drawn from a similar summary of industry changes. Again, we find wider dispersion in the postwar than in the pre-war period. Detailed census-year-to-census-year changes in real earnings for each of the 49 States are given in Table 113. The State of Delaware has the distinction in the period of war-time expansion, from 1914 to 1919, of being the one in which the purchasing power of money earnings increased more than in any other State, the increase amounting to 63 per cent as compared with 17.5 per cent for the country as a whole. At the other extreme, we find Nevada, whose wage earnings, on the average, experienced a depreciation of real earnings from 1914 to 1919 of 16.4 per cent. In the period between 1919 and 1921, Delaware comes close to ranking first in point of extent of fall in purchasing power of money earnings, but her decline of 35.5 per cent is exceeded by one other State, Arizona, whose fall in per capita real earnings was 40.6 per cent. In the period 1914 to 1919 only seven States failed to share the general increase in per capita real earnings and in these seven States there were slumps in real earnings ranging from about 1 per cent in Colo-

rado to 16 per cent in Nevada. Between 1919 and 1921, there were only three States which showed an increase in the purchasing power of money earnings, namely, the District of Columbia, Utah and Nevada, the amount of increase being 5 per cent for Utah, and 4.3 per cent for Nevada. Not a single State failed to share in the increases in real earnings which took place between 1921 and 1923. These increases ranged from 12.6 per cent in South Dakota to 61.9 per cent in Connecticut.

TABLE 111.—CONSPECTUS OF STATE CHANGES IN REAL EARNINGS—THE 48 STATES AND THE DISTRICT OF COLUMBIA, AND THE WAGE EARNERS EMPLOYED THEREIN, DISTRIBUTED ACCORDING TO THE DIRECTION AND DEGREE OF CHANGE IN "REAL" EARNINGS, PER CAPITA, FROM CENSUS YEAR TO CENSUS YEAR—ALL INDUSTRIES COMBINED, CENSUS YEARS: 1899–1923

DIRECTION AND DEGREE OF CHANGE	THE NUMBER OF INDUSTRIES IN EACH DEGREE-OF-CHANGE GROUP AND PERCENTAGE BORNE BY THE AVERAGE NUMBER OF WAGE EARNERS IN THOSE INDUSTRIES TO TOTAL NUMBER OF WAGE EARNERS IN MANUFACTURING INDUSTRY											
	1899–1904		1904–1909		1909–1914		1914–1919		1919–1921		1921–1923	
	Number [1]	Per cent	Number [2]	Per cent	Number [3]	Per cent	Number [4]	Per cent	Number [5]	Per cent	Number [6]	Per cent
Number of States in which real earnings *rose*	32	39.91	44	97.46	2	3.62	42	96.99	3	0.36	49	100.03
Percentage of rise:												
60–64.9							[a] 1	.31			[a] 1	3.04
55–59.9												
50–54.9												
45–49.9												
40–44.9							[b] 3	16.67			[b] 7	31.81
35–39.9							[c] 4	15.04			[c] 8	16.29
30–34.9							[d] 5	9.82			[d] 16	35.98
25–29.9							[e] 5	25.47			[e] 6	6.23
20–24.9			[a] 1	1.09			[f] 7	10.04			[f] 7	5.92
15–19.9	[a] 2	.54					[g] 6	10.54			[g] 2	.59
10–14.9	[b] 6	2.67	[b] 16	37.35			[h] 8	7.86			[h] 2	.17
5–9.9	[c] 11	8.58	[c] 21	55.88	[a] 1	3.50	[i] 2	1.11	[a] 2	.33		
Under 5	[d] 13	28.12	[d] 6	3.14	[b] 1	.12	[j] 1	.13	[b] 1	.03		
Percentage of fall:												
Under 5	[e] 12	28.85	[e] 5	2.55	[c] 7	9.64	[k] 3	2.42	[c] 4	3.46		
5–9.9	[f] 5	31.46			[d] 16	27.91	[l] 1	.13	[d] 5	3.05		
10–14.9					[e] 19	56.30	[m] 2	.39	[e] 4	5.10		
15–19.9					[f] 5	2.81	[n] 1	.05	[f] 10	26.70		
20–24.9									[g] 12	30.29		
25–29.9									[h] 8	30.42		
30–34.9									[i] 1	.63		
35–39.9									[j] 1	.32		
40–44.9									[k] 1	.09		
Number of States in which real earnings *fell*	17	60.31	5	2.55	47	96.99	7	2.99	46	100.06	0	.00
Total		100.22		100.01		100.28		99.98		100.42		100.03

[1] The States represented by the numbers in this column are:
- [a] Arkansas, Oklahoma.
- [b] Idaho, Mississippi, Montana, New Mexico, North Carolina, Oregon.
- [c] Alabama, California, Florida, Georgia, Louisiana, Maine, Nevada, North Dakota, Utah, Washington, West Virginia.
- [d] District of Columbia, Illinois, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio, South Carolina, Tennessee, Vermont, Wisconsin, Wyoming.
- [e] Arizona, Colorado, Indiana, Kansas, Kentucky, Maryland, New Hampshire, New York, Rhode Island, South Dakota, Texas, Virginia.
- [f] Connecticut, Delaware, Massachusetts, New Jersey, Pennsylvania.

[2] The States represented by the numbers in this column are:
- [a] South Carolina.
- [b] California, Delaware, District of Columbia, Georgia, Iowa, Kansas, Maryland, Michigan, New York, North Carolina, Ohio, Oregon, Rhode Island, South Dakota, Utah, Vermont.
- [c] Alabama, Connecticut, Florida, Illinois, Indiana, Kentucky, Maine, Massachusetts, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, North Dakota, Oklahoma, Pennsylvania, Texas, Washington, West Virginia, Wisconsin, Wyoming.
- [d] Arizona, Colorado, Nevada, New Mexico, Tennessee, Virginia.
- [e] Arkansas, Idaho, Louisiana, Mississippi, Montana.

[1] The States represented by the numbers in this column are:
[a] Michigan.
[b] Idaho.
[c] Indiana, Iowa, Nebraska, North Carolina, South Carolina, Virginia, West Virginia.
[d] Alabama, Arkansas, Illinois, Kentucky, Louisiana, Maine, Maryland, Minnesota, New Hampshire, New Mexico, North Dakota, Ohio, Oklahoma, Tennessee, Vermont, Wisconsin.
[e] Arizona, Connecticut, Delaware, District of Columbia, Florida, Georgia, Kansas, Massachusetts, Mississippi, Missouri, Nevada, New Jersey, New York, Pennsylvania, Rhode Island, South Dakota, Texas, Utah, Washington.
[f] California, Colorado, Montana, Oregon, Wyoming.

[2] The States represented by the numbers in this column are:
[a] Delaware.
[b] Maryland, North Carolina, Pennsylvania.
[c] New Jersey, Ohio, South Carolina, Virginia.
[d] Arizona, Connecticut, Georgia, Maine, Michigan.
[e] Alabama, Massachusetts, Mississippi, New York, Wyoming.
[f] Florida, Indiana, Kansas, Nebraska, New Hampshire, Rhode Island, Wisconsin.
[g] Illinois, Iowa, Kentucky, South Dakota, Vermont, West Virginia.
[h] Arkansas, Louisiana, Minnesota, Missouri, Oklahoma, Oregon, Tennessee, Washington.
[i] North Dakota, Texas.
[j] District of Columbia.
[k] California, Colorado, New Mexico.
[l] Idaho.
[m] Montana, Utah.
[n] Nevada.

[3] The States represented by the numbers in this column are:
[a] District of Columbia, Utah.
[b] Nevada.
[c] California, Colorado, Oklahoma, Wyoming.
[d] Idaho, Kentucky, North Dakota, Texas, West Virginia.
[e] Minnesota, Missouri, Montana, Tennessee.
[f] Illinois, Iowa, Kansas, Louisiana, Nebraska, New Mexico, New York, Rhode Island, South Dakota, Virginia.
[g] Arkansas, Florida, Indiana, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, Oregon, Vermont, Washington, Wisconsin.
[h] Alabama, Connecticut, Georgia, Maryland, North Carolina, Ohio, Pennsylvania, South Carolina.
[i] Mississippi.
[j] Delaware.
[k] Arizona.

[4] The States represented by the numbers in this column are:
[a] Connecticut.
[b] Alabama, Michigan, New Jersey, New Mexico, Ohio, Pennsylvania, Washington.
[c] Delaware, Massachusetts, Mississippi, Montana, North Carolina, Oregon, Rhode Island, Wisconsin.
[d] Arkansas, California, District of Columbia, Florida, Idaho, Illinois, Indiana, Kentucky, Maryland, Nevada, New Hampshire, New York, Tennessee, South Carolina, Vermont, West Virginia.
[e] Arizona, Louisiana, Maine, Missouri, Oklahoma, Virginia.
[f] Colorado, Georgia, Iowa, Kansas, Minnesota, North Dakota, Texas.
[g] Nebraska, Utah.
[h] South Dakota, Wyoming.

TABLE 112.—DISTRIBUTION OF 147 CASES OF PRE-WAR STATE CHANGES IN "REAL" EARNINGS FROM CENSUS YEAR TO CENSUS YEAR, COMPARED WITH SIMILAR DISTRIBUTION OF 147 POSTWAR CASES

[Based on link relatives for 48 States and District of Columbia]

PER CENT OF CHANGE FROM PER CAPITA "REAL" EARNINGS OF PRECEDING CENSUS YEAR	NUMBER OF CASES			PER CENT OF CHANGE FROM PER CAPITA "REAL" EARNINGS OF PRECEDING CENSUS YEAR	NUMBER OF CASES		
	1899–1914	1914–1923	1899–1923		1899–1914	1914–1923	1899–1923
Increases:				Decreases:			
60–64.9	-------	2	2	Under 5	24	7	31
55–59.9	-------	-------	-------	5–9.9	21	6	27
50–54.9	-------	-------	-------	10–14.9	19	6	25
45–49.9	-------	-------	-------	15–19.9	5	11	16
40–44.9	-------	10	10	20–24.9	-------	12	12
35–39.9	-------	12	12	25–29.9	-------	8	8
30–34.9	-------	21	21	30–34.9	-------	1	1
25–29.9	-------	11	11	35–39.9	-------	1	1
20–24.9	1	14	15	40–44.9	-------	1	1
15–19.9	2	8	10				
10–14.9	22	10	32	Total cases	147	147	294
5–9.9	33	4	37				
Under 5	20	2	22				

TABLE 113.—PERCENTAGE OF CHANGE IN REAL EARNINGS, PER CAPITA, FROM ONE CENSUS YEAR TO THE NEXT, BY STATES, ALL INDUSTRIES COMBINED: 1899–1923

[A minus sign (−) denotes decrease]

STATE	PERCENTAGE OF CHANGE FROM—					
	1899–1904	1904–1909	1909–1914	1914–1919	1919–1921	1921–1923
United States	−3.5	10.0	−10.0	17.5	−12.1	41.0
Maine	5.1	8.4	−9.0	31.7	−22.4	27.3
New Hampshire	−1.9	8.6	−7.0	21.5	−21.1	33.2
Vermont	.4	11.6	−9.4	17.2	−20.1	32.1
Massachusetts	−6.2	8.9	−11.2	25.1	−22.9	37.8
Rhode Island	−4.2	11.0	−13.0	22.9	−19.4	36.4
Connecticut	−7.1	8.7	−14.3	31.3	−29.3	61.9
New York	−4.2	11.9	−13.1	29.7	−17.9	34.1
New Jersey	−5.3	8.8	−12.0	37.4	−23.7	42.6
Pennsylvania	−5.1	8.7	−11.3	42.3	−29.5	43.1
Ohio	.5	10.6	−8.4	35.9	−26.7	41.0
Indiana	−2.9	9.6	−3.9	24.1	−20.3	34.2
Illinois	1.6	7.8	−7.5	19.5	−16.4	31.8
Michigan	2.8	11.6	6.2	31.3	−23.8	41.0
Wisconsin	2.7	9.6	−9.0	24.7	−23.9	36.4
Minnesota	1.7	9.7	−9.3	14.0	−14.6	22.6
Iowa	1.4	14.7	−3.2	15.9	−16.0	22.1
Missouri	1.5	6.8	−10.4	12.8	−13.3	26.0
North Dakota	5.2	9.5	−6.0	6.3	−6.7	22.5
South Dakota	−.9	12.6	−11.5	16.1	−17.2	12.6
Nebraska	1.2	5.9	−4.1	22.3	−19.7	19.5
Kansas	−.5	10.6	−13.0	24.6	−17.5	22.5
Delaware	−5.1	10.7	−14.4	65.2	−35.5	36.5
Maryland	−1.8	10.7	−6.9	41.9	−26.6	30.6
District of Columbia	1.2	11.9	−14.4	3.9	6.9	32.0
Virginia	−1.9	4.7	−3.2	36.0	−17.8	28.9
West Virginia	8.9	8.1	−3.8	17.1	−8.9	30.1
North Carolina	10.5	13.6	−4.2	41.8	−25.7	39.3
South Carolina	3.6	20.5	−2.6	37.6	−26.4	30.6
Georgia	6.3	14.0	−12.0	32.6	−25.5	24.3
Florida	5.1	7.8	−10.6	20.0	−23.8	32.1
Kentucky	−1.2	5.0	−6.5	15.2	5.1	33.0
Tennessee	1.4	2.8	−7.0	13.5	−12.3	30.8
Alabama	7.8	7.9	−8.2	27.0	−25.0	42.1
Mississippi	11.7	−2.2	−11.0	27.7	−30.9	35.8
Arkansas	18.0	−2.2	−7.1	13.5	−24.4	34.5
Louisiana	8.9	−2.3	−7.0	11.7	−19.2	28.2
Oklahoma	17.9	7.7	−7.5	10.8	−3.4	28.4
Texas	−2.3	8.9	−10.7	6.8	−6.7	22.0
Montana	10.1	−2.2	−18.7	−10.1	−11.8	36.8
Idaho	10.1	−.1	1.6	−6.5	−9.2	31.1
Wyoming	1.2	7.0	−15.0	29.2	−2.4	14.7
Colorado	−1.0	2.8	−15.5	−2.9	−1.4	22.6
New Mexico	10.3	1.8	−8.5	−3.3	−19.5	43.5
Arizona	−2.4	3.9	−14.8	34.8	−40.6	29.4
Utah	7.5	11.8	−11.4	−14.4	5.0	18.1
Nevada	6.2	3.0	−11.0	−16.4	4.3	31.1
Washington	6.3	8.7	−14.1	12.8	−24.9	43.9
Oregon	13.1	12.8	−15.9	−13.1	−23.6	39.6
California	7.5	13.8	−15.8	−3.0	−1.1	31.0

Part IV

VARIABILITY OF EARNINGS

Chapter X

VARIATION IN MONEY EARNINGS IN 1919

Since throughout this analysis there has been such complete reliance upon the single census average[a] obtained by dividing the amount paid in wages by the average number of wage earners, it was felt that it would be desirable to supplement the estimates of average earnings derived from the census average wage with data which might throw at least a little light upon the extent to which, within the separate industries and regions, individual establishments scattered above and below the regional or industry average. In view of the somewhat detailed discussion in earlier pages, and in subsequent sections also, of the characteristics of the average, particularly the census average, it seems hardly necessary to go into it any more fully here. It is enough to point out the scope and nature of the sample used for the study of variability of wages and to report the results shown upon analysis of this sample.

NATURE AND SCOPE OF THE SAMPLE

After some experimentation with the leading industries in two large manufacturing centers in successive census years, it was finally decided to confine the analysis to the single year 1919. In that census year, 20 of the more important of our 41 selected industries were chosen for this special inquiry. These industries are the ones listed in Table 114.[1] The selected industries, 20 in number, were not taken for the whole of the United States, but only the establishments, in those industries, which reported to the census from the following seven cities: Boston, Cleveland, Detroit, New York, Pittsburgh, San Francisco, and St. Louis. The city of Chicago is added, for some purposes, and some of the totals, therefore, include figures for eight cities, but the detailed analysis by industries does not include Chicago. Moreover, only 12 of the 20 industries listed in Table 114 are separately analyzed for variability.

The 20 industries in these seven cities employed in 1919 an aggregate average number of wage earners totaling 426,989, employed in 10,368 establishments. Both wage earners and establishments con-

[a] See initial paragraph of Ch. XIII.

[1] One industry—brass, bronze, and copper products—is not included in the main inquiry, but is included in the special study. It was originally intended to include this among our 41 selected industries, but the fact that it was not homogeneously reported throughout the period made it impossible to retain it on the list.

stituted about 10 per cent of the wage earners and establishments, respectively, in those industries in the whole of the United States. The wage earners in the eight cities included in the inquiry numbered slightly over half a million and constituted, as indicated in

TABLE 114.—REPRESENTATIVENESS OF SAMPLE USED FOR SPECIAL ANALYSIS OF EARNINGS IN 1919

SELECTED INDUSTRY [1]	INCLUDED IN VARIABILITY STUDY		UNITED STATES: 20 INDUSTRIES		PERCENTAGE INCLUDED	
	Establishments	Wage earners	Establishments	Wage earners	Establishments	Wage earners
Tobacco, cigars and cigarettes [2]	1,205	24,944	9,926	35,585	12	70
Slaughtering and meat packing [2]	74	1,284	1,304	160,996	6	1
Flour-mill and gristmill products	28	941	10,708	45,481		21
Mineral and soda waters [2]	294	1,846	5,194	17,440	6	11
Clothing, women's [2]	5,340	109,251	7,711	165,649	69	66
Cotton manufactures	19	1,529	1,288	430,966	1	3
Boots and shoes, not including rubber boots and shoes [2]	291	29,362	1,449	211,049	20	14
Lumber and timber products	10	589	26,119	480,945	(3)	(3)
Furniture [2]	663	14,258	3,154	138,331	21	10
Paper and wood pulp	5	441	729	113,759	1	
Printing and publishing, newspapers and periodicals [2]	447	25,531	17,362	120,381	3	21
Glass	21	3,467	371	77,520	6	4
Petroleum refining	7	3,367	320	58,889	2	6
Iron and steel, steel works and rolling mills [2]	54	38,313	500	375,088	11	10
Foundry and machine-shop products [2]	1,477	76,177	10,934	482,767	14	16
Brass, bronze, and copper products [2]	269	16,982	1,092	75,051	25	23
Automobiles [2]	59	46,826	315	210,559	19	22
Steam-railroad repair shops [2]	48	21,521	1,744	484,437	3	4
Agricultural implements	2	227	521	54,368	(3)	(3)
Rubber goods	55	10,133	437	119,848	12	8
Total	10,368	426,989	101,178	3,859,109	10	11

CITY	INCLUDED IN VARIABILITY STUDY		EIGHT CITIES: ALL INDUSTRIES		PERCENTAGE INCLUDED	
	Establishments	Wage earners	Establishments	Wage earners	Establishments	Wage earners
Boston	580	27,299	3,077	88,759	19	31
Chicago	1,734	96,857	10,537	403,942	16	24
Cleveland	550	59,234	2,946	157,730	18	37
Detroit	397	67,596	2,176	167,016	18	40
New York	7,534	185,410	32,590	638,775	23	29
Pittsburgh	360	46,723	1,875	83,290	19	56
San Francisco	427	9,630	2,360	48,550	18	20
St. Louis	521	31,097	3,205	107,919	16	29
Total	12,103	523,846	58,766	1,695,981	21	31

[1] The classification by industries in the upper part of the table includes all of the 8 cities, listed in the lower part, except Chicago.
[2] Industries separately tabulated. See Table 117, p. 235, and Table 119, p. 238.
[3] Less than one-half of 1 per cent.

Table 114, 31 per cent of the wage earners employed in all industries in the eight cities. The more than 12,000 establishments included in the eight cities constituted 21 per cent of all manufacturing establishments in those cities. The representativeness of the sample used is shown in detail in Table 114 for each city and industry. It is evi-

dent at once that there are several of the industries in respect to which the sample represents too small a proportion to justify presenting results for the industry separately. On this account, there was no attempt made to report results separately for 8 of the 20 industries. The remaining 12 for which the samples represent a sizable proportion of the industry are made the basis of detailed analysis. The totals for the whole group combined include, of course, all 20 industries. In respect to the cities, there is in every case a very large proportion of the wage earners of the city represented in the 20 industries included in our sample, the proportion of the wage earners in all manufacturing industries in the respective cities ranging from 20 per cent in San Francisco to 56 per cent in Pittsburgh. The proportion of all manufacturing establishments in the above cities covered by the present sample ranged from 16 per cent in St. Louis and Chicago to 23 per cent in New York.

In Table 115 the 12 separately analyzed industries and the 8 cities, 7 of which are included in the figures for the separate industries, are

TABLE 115.—MEDIAN ESTABLISHMENT AVERAGES OF ACTUAL EARNINGS: 1919

INDUSTRY	Median establishment average	CITY	Median establishment average
Slaughtering, wholesale, not including meat packing	$1,541	Pittsburgh	$1,433
Iron and steel, steel works and rolling mills	1,521	Detroit	1,424
Automobiles	1,456	Cleveland	1,389
Cars and general shop construction and repairs by steam railroads	1,433	8 cities combined	1,316
Printing and publishing, newspapers and periodicals	1,423	Chicago	1,243
20 industries combined	1,316	San Francisco	1,194
Foundry and machine-shop products	1,289	New York	1,184
Brass, bronze, and copper products	1,249	Boston	1,105
Furniture	1,244	St. Louis	958
Mineral and soda waters	1,121		
Clothing, women's	1,120		
Boots and shoes, not including rubber boots and shoes	949		
Tobacco, cigars and cigarettes	704		

arranged according to the median establishment average in each city and industry group.[2] It is to be noted that this is the median of the census averages, for all of the establishments in the industry, discounted for the time during which the plant was shut down. It represents, therefore, the median average of actual annual earnings per capita. A comparison between the median establishment averages shown in Table 115 with the estimated averages shown in Parts II and III and based upon all industries and upon the whole of the United States shows considerable differences.[3] First of all, it is to

[2] The method of arriving at these median establishment averages, as well as the whole procedure underlying the construction of the tables in this and the following chapter, is explained in detail in Ch. XX.

[3] Such a comparison is made in Table 15, p. 45.

be remembered that the averages, based upon the whole of manufacturing industry throughout the United States, when they are reported for the selected industries separately, are shown, not for men and women wage earners combined, as is the case in Table 115, but either for men alone or for men and women separately. It is very probable, nevertheless, even though the averages in the main part of this inquiry were in each selected industry based as they are in Table 115 upon both sexes combined, that there would still be no inconsiderable differences between these medians and the arithmetic means. In the case of such differences we can only conclude that the arithmetic means, representing as they do all manufacturing industry in the whole of the United States, must be most nearly correct. In view of these facts, it would be a serious mistake to make hasty inferences from the data in this chapter and the following, especially about the exact amounts of earnings. The figures in this and the following tables are designed not to show amounts of earnings so much as to indicate the degree of concentration of the establishments within an industry around the median establishment. Now, the figures in Table 115 are of practically no use from this point of view. They serve merely as a summary of the results obtained in the analysis and perhaps also to indicate how wide a range there seems to be among the 12 industry medians and, less strikingly, among the 8 city medians. The median earnings in the slaughtering industry were more than twice those in the median establishment of the tobacco industry. In respect to the cities there is also a wide range but it is considerably less wide than in the case of the industries. St. Louis is the city where per capita actual earnings appear to have been lowest and Pittsburgh the one where they were highest.

VARIATIONS IN MONEY EARNINGS, BY CITIES

When to the medians are added the establishments which occupy less central positions in respect to the per capita actual earnings received in them, it is possible to get something like a satisfactory notion of the extent to which average per capita earnings really represent the style in earnings. In other words, we get some idea of the proportion of establishments in a given city or industry whose wage earners receive annually per capita amounts of earnings more or less closely approximating the average per capita amounts received. If we take the 580 establishments included in our sample in the city of Boston, pick out the midmost establishment, which in this case (since there are an even number of establishments) can be taken as either the 290th or the 291st establishment in the array, and set down the sum of money earnings per capita estimated to have been received in that establishment we have in that sum ($1,105 in this

case) a sample of the statistical unit on which reliance is placed in this part of the analysis.

But it is not necessary to confine the examination to the median plant. Use can be made here also of the percentile distribution. The amounts of earnings in the decil and extreme establishments are shown for each of the eight cities in Table 116. Obviously we can not take seriously either the "high" or "low" establishments indicated in the table. They represent unquestionably very abnormal conditions of some sort. In the case of the "high" item there is probably involved an establishment which consists, perhaps, of no other employees than the proprietor; or, perhaps, one or two additional employees in addition to the proprietor. In such cases, of course, per capita earnings are bound to be extraordinarily high. The minimum establishment or the establishment from which minimum per capita earnings are reported probably also represents a

TABLE 116.—VARIATION IN ACTUAL MONEY EARNINGS IN 8 CITIES FOR 20 SELECTED INDUSTRIES: 1919

	8 cities	Boston	Chicago	Cleveland	Detroit	New York	Pittsburgh	San Francisco	St. Louis
Low	$14	$70	$12	$54	$107	$14	$98	$52	$24
First decil	728	783	861	876	1,018	634	727	722	702
Second decil	878	783	1,031	1,059	1,296	796	1,191	862	804
Third decil	1,034	879	1,151	1,228	1,350	957	1,323	972	819
Fourth decil	1,193	985	1,203	1,321	1,406	1,066	1,384	1,034	906
Median	1,316	1,105	1,243	1,389	1,424	1,184	1,433	1,194	958
Sixth decil	1,403	1,210	1,340	1,456	1,499	1,308	1,453	1,331	1,046
Seventh decil	1,468	1,276	1,411	1,521	1,525	1,425	1,576	1,424	1,179
Eighth decil	1,568	1,385	1,517	1,597	1,584	1,565	1,778	1,539	1,300
Ninth decil	1,778	1,610	1,766	1,698	1,673	1,840	2,020	1,724	1,472
High	5,355	3,093	5,183	2,853	2,707	5,355	2,546	3,171	3,084

very small concern or, possibly, a concern which had operated for only a very short period during the year. Discarding, then, the high and low items and giving attention to the decil items it would appear, for example, that in Boston in eight-tenths of the 580 establishments reported from that city the average actual earnings received were between $783 and $1,610. In four-tenths of the establishments, or nearly half of them, the average earnings are between $879 and $1,276. It is to be noticed that in proportion as the decils near to the median, are sums very close to the amounts of earnings entered for the median, in that measure, there is concentration about a typical wage. The tendency, then, for per capita earnings in most of the establishments to be the same as it is in the average for all establishments is measured by the closeness of the decil items to the median item.

To what degree this smaller or greater concentration of per capita earnings for establishments around the median establishment

measures a corresponding concentration of the earnings of individual wage earners around the average is a somewhat more dubious question. The most we can say is that the fact that there is a strong tendency among the establishments to show a high concentration of per capita earnings around a median per capita sum is presumptive evidence of a similarly high degree of concentration of individual workers' earnings around the average for all wage earners. Unfortunately we do not have the original raw material in the form of earnings for individual wage earners, but as intimated in Chapter I it would seem, judging by the results obtained from establishments which vary among themselves almost as widely as the earnings could possibly vary, that we may be justified in concluding that the presumptive evidence is strong.

INDUSTRIAL DIFFERENCES IN VARIABILITY

More important than the median and decil establishment averages for the different cities are the corresponding items for the 12 industries which have been tabulated separately. These figures are given in Table 117. There is evident here an even wider range between establishments where the per capita actual earnings are very high and those at the other extreme where they are very low than is the case with the city returns in Table 116. There is, however, a very great difference in the degree of variation of earnings in the different industries. How great these differences are will be evident after a reinspection of Figure 3 which is drawn from the data of Table 117. Good examples are the newspaper printing and publishing industry and the automobile industry, the former representing a relatively high, the latter a relatively low, degree of variation in earnings so far as we may judge from arrays in which the *establishment* per capita wage payment (or census average wage) is the unit. Expressing it in slightly different form, the figures indicate that there is a higher degree of concentration around the average earnings in the automobile industry than in most of the other industries shown in the table. Three-tenths of the wage earners in that industry were employed in establishments where the per capita earnings were between $1,424 and $1,499; that is to say, nearly one-third of the wage earners in this industry worked in establishments where the per capita earnings were very close to the median for the industry, which is $1,456. The per capita earnings received by the wage earners in six-tenths of the establishments were between $1,333 and $1,525. In one-tenth of the establishments the per capita earnings received were between $1,590 and $2,240; in another one-tenth between $1,525 and $1,590. At the other extreme, one-tenth of the establishments had per capita earnings between $628 and $1,326; another one-tenth between $1,326 and $1,333.

In the printing and publishing industry the situation is very different. First of all, the range between the first and ninth decils is greater, being from $973 to $1,885, as compared with a range between $1,326 and $1,590 in the automobile industry. In the printing and publishing industry in six-tenths of the establishments, per

TABLE 117.—HIGH, LOW, MEDIAN, AND DECIL ESTABLISHMENTS—AVERAGES OF MONEY EARNINGS IN 1919 FOR 20 INDUSTRIES COMBINED AND SEPARATELY FOR 12 INDUSTRIES

	Total, 20 industries	Tobacco, cigars and cigarettes	Boots and shoes, not including rubber boots and shoes	Clothing, women's	Mineral and soda waters	Furniture
Number of establishments	10,368	1,205	291	5,340	294	663
Number of wage earners	426,989	24,944	29,362	109,251	1,846	14,258
Low	$14	$24	$172	$14	$59	$14
First decil	728	493	738	629	777	855
Second decil	878	557	783	773	915	947
Third decil	1,034	566	810	886	1,006	1,023
Fourth decil	1,193	635	825	1,002	1,060	1,137
Median	1,316	704	949	1,120	1,121	1,244
Sixth decil	1,403	733	1,007	1,266	1,180	1,319
Seventh decil	1,468	853	1,053	1,444	1,270	1,399
Eighth decil	1,568	963	1,209	1,643	1,359	1,521
Ninth decil	1,778	1,164	1,396	1,953	1,499	1,695
High	5,355	2,623	2,825	5,355	2,515	5,028
Per capita money earnings for all establishments reported by the Bureau of the Census [1]	1,212	564	1,149	1,137	850	1,192

	Brass, bronze, and copper products	Foundry and machine-shop products	Printing and publishing, newspapers and periodicals	Steam-railroad repair shops	Automobiles	Iron and steel, steel works and rolling mills	Slaughtering and meat packing
Number of establishments	269	1,477	447	48	59	54	74
Number of wage earners	16,982	76,177	25,531	21,521	46,826	38,313	1,284
Low	$181	$70	$94	$715	$628	$229	$59
First decil	795	989	973	747	1,326	962	1,051
Second decil	805	1,084	1,213	1,365	1,333	1,300	1,144
Third decil	1,005	1,189	1,338	1,365	1,424	1,384	1,323
Fourth decil	1,183	1,222	1,398	1,426	1,424	1,438	1,473
Median	1,249	1,289	1,423	1,433	1,456	1,521	1,541
Sixth decil	1,296	1,377	1,497	1,459	1,499	1,610	1,541
Seventh decil	1,335	1,465	1,573	1,472	1,523	1,778	1,570
Eighth decil	1,520	1,554	1,773	1,568	1,525	2,020	1,783
Ninth decil	1,794	1,695	1,885	1,633	1,590	2,020	2,053
High	3,813	4,210	4,281	2,419	2,240	2,079	3,443
Per capita money earnings for all establishments reported by the Bureau of the Census [1]	(2)	1,450	1,205	1,394	1,278	1,728	1,484

[1] For tobacco; mineral and soda waters; printing and publishing, newspapers and periodicals; boots and shoes; and women's clothing the figures are weighted averages of the figures given for 1919 for men and women in Table 44 (weights based on the percentages of Table G); for the other industries, the figures are taken directly from actual earnings figures in Table 38.

[2] This industry not included in the 41 selected industries reported in this monograph.

capita earnings ranged between $1,213 and $1,773. The highest tenth of the establishments had average earnings ranging between $1,855 and $4,281. The lowest tenth of the establishments had average earnings ranging between $94 and $973. Among the other industries rather high degrees of variation are found in women's clothing and in furniture, and rather relatively low degrees of variation (high concentration in other words) in steam-railroad repair shops, foundry and machine shops, and iron and steel.

CLASSIFIED EARNINGS TABLES

Another way of showing the extent of variation in earnings is by means of the classified wage table, which shows, not the per capita amount of earnings in median and decil establishments, but the number of establishments having per capita earnings amounts falling within certain brackets. Such a classified arrangement of the results of the special inquiry for the year 1919 is given in Table 118. The

TABLE 118.—DISTRIBUTION OF WAGE EARNERS ACCORDING TO ESTIMATED FULL-TIME AND ACTUAL ANNUAL EARNINGS IN 1919, WITH ABSOLUTE AND CUMULATIVE PER CENT DISTRIBUTION OF WAGE EARNERS; FOR 20 INDUSTRIES COMBINED

ANNUAL EARNINGS	FULL-TIME BASIS				ACTUAL-TIME BASIS			
	Number of establishments	Wage earners			Number of establishments	Wage earners		
		Number	Per cent distribution			Number	Per cent distribution	
			Absolute	Cumulative			Absolute	Cumulative
Total	10,368	426,989	100.0		10,368	426,989	100.0	
Less than $300	47	883	.3	100.0	435	3,297	.8	100.0
$300–$399	55	697	.1	99.7	223	1,616	.4	99.3
$400–$499	102	1,620	.4	99.6	296	4,614	1.0	98.9
$500–$599	252	7,053	1.6	99.2	448	12,272	2.9	97.9
$600–$699	447	9,794	2.3	97.6	588	13,690	3.3	95.0
$700–$799	597	23,813	5.6	95.4	710	28,913	6.8	91.7
$800–$899	680	27,482	6.5	89.3	747	27,349	6.4	84.9
$900–$999	754	24,925	5.8	83.3	792	26,157	6.1	78.5
$1,000–$1,099	886	29,341	7.2	77.5	821	30,283	7.1	72.4
$1,100–$1,199	767	26,070	6.1	70.3	762	25,356	6.0	65.3
$1,200–$1,299	838	27,505	6.4	64.2	773	34,842	8.2	59.3
$1,300–$1,399	747	42,718	10.1	56.7	643	46,288	10.8	51.2
$1,400–$1,499	678	64,218	15.0	46.6	593	59,592	14.0	40.3
$1,500–$1,599	692	46,817	10.9	33.1	585	41,613	9.7	26.3
$1,600–$1,699	538	26,897	6.3	22.0	398	17,983	4.2	16.6
$1,700–$1,799	403	16,185	4.0	15.9	320	14,081	3.3	12.4
$1,800–$1,899	406	12,757	3.0	11.9	286	10,265	2.4	9.1
$1,900–$1,999	284	7,766	1.8	8.9	202	7,015	1.8	6.7
$2,000–$2,099	280	13,335	3.1	7.1	179	11,197	2.6	5.1
$2,100–$2,199	176	5,583	1.3	4.0	124	2,571	.6	2.5
$2,200–$2,299	138	1,991	.5	2.7	82	1,352	.4	1.9
$2,300–$2,399	110	2,408	.5	2.2	78	1,677	.3	1.5
$2,400–$2,499	93	1,510	.4	1.7	65	1,134	.3	1.2
$2,500–$2,599	71	951	.2	1.3	36	554	.1	.9
$2,600–$2,699	55	1,054	.3	1.1	31	876	.2	.8
$2,700–$2,799	47	673	.1	.8	33	553	.2	.6
$2,800–$2,899	49	744	.2	.7	18	438	.1	.4
$2,900–$2,999	24	334	.1	.5	15	201		.3
$3,000 and over	152	1,815	.4	.4	85	1,210	.3	.3

figures report the number of establishments (and of wage earners in those establishments) in which the per capita earnings come within the designated brackets. It presents this frequency distribution on both the full-time and actual-time basis. That is to say, it shows the distribution of the establishments and the wage earners in them according to the full-time equivalent of earnings received, without any discount for short-time operation, and it shows the same distribution for actual earnings which are computed by making a discount for the proportion of the year that the establishment was not in operation. For both columns of wage earners there are inserted absolute and cumulative percentage distributions. These distributions, it should be pointed out, do not indicate the number of wage earners whose earnings amounted to designated sums during the year but the proportion of the total number of wage earners included in the sample who were employed in establishments where the per capita earnings came within the indicated earnings class.

Use is made primarily of the frequency distribution based on actual time. In this distribution in Table 118 it will be noticed that the modal or typical earnings amount was in the class $1,400 to $1,499. Thirty-three per cent of the wage earners were employed, it seems, in concerns in which per capita earnings ranged between $1,200 and $1,500. In the light of the figures given in earlier chapters this is undoubtedly too high, and here again the caution should be given that these figures can not be taken as accurately measuring *amounts* of earnings. The estimates given in Parts II and III have their margins of error, but based as they are, not upon a sample but on the whole body of manufacturing wage earners, they are far nearer the truth, it is believed, than the figures which have resulted from this special inquiry. What we may legitimately get out of this frequency distribution and of other frequency distributions following is some notion of the degree of concentration. The largest single group of wage earners in the frequency distributions of actual earnings in Table 118 is a group of more than 59,000, making up 14 per cent of all the wage earners and who worked in the 593 establishments where earnings were most highly concentrated, yet very large proportions of the wage earners worked in establishments where the per capita earnings were much higher or much lower. Thus as large a proportion as 7 per cent of the wage earners worked in establishments where the per capita earnings were in the $700 group; 3 per cent worked in establishments in which per capita earnings were in the $600 group.

Absolute percentage distributions corresponding to those given in Table 118 for actual earnings are presented in Table 119 for each

of the 12 industries as well as for the 20 industries combined.[4] The table brings out very clearly some striking differences among the 12 industries in respect to the degree of variability of earnings. The percentages definitely confirm the evidence of the medians and decils in Table 117 in respect to the degree of concentration in the different groups. The most outstanding cases of high concentration—low variability—are automobiles, steam-railroad repair shops, and slaughtering and meat packing. At the other extreme, involving extremely high variability in earnings, are the women's clothing industry, the furniture industry, and, apparently, printing and publishing.

TABLE 119.—CLASSIFIED ACTUAL EARNINGS, PER CAPITA, IN 1919, BY INDUSTRIES: PER CENT DISTRIBUTION OF WAGE EARNERS ACCORDING TO PER CAPITA EARNINGS IN ESTABLISHMENT IN WHICH THEY WERE EMPLOYED

[Based on establishment schedules from 7 cities]

ANNUAL PER CAPITA EARNINGS	20 industries combined	Automobiles	Boots and shoes, not including rubber boots and shoes	Brass, bronze, and copper products	Cars and general shop construction and repairs by steam-railroad companies	Clothing, women's
Total number of establishments	10,368	59	291	269	48	5,340
Total number of wage earners	426,989	46,826	29,362	16,982	21,521	109,251
Total	100.0	100.0	100.0	100.0	100.0	100.0
Less than $300	.8	----	.3	2.5	----	1.1
$300–$399	.4	----	.1	----	----	1.1
$400–$499	1.0	----	.2	----	----	1.9
$500–$599	2.9	----	1.2	.1	----	4.2
$600–$699	3.3	.4	5.0	1.4	----	6.4
$700–$799	6.8	----	18.8	15.7	10.1	8.0
$800–$899	6.4	1.8	16.7	7.5	----	8.5
$900–$999	6.1	----	15.7	2.5	----	8.7
$1,000–$1,099	7.1	1.4	14.8	6.9	----	8.2
$1,100–$1,199	6.0	1.3	5.5	6.1	.6	7.8
$1,200–$1,299	8.2	2.3	4.4	18.9	5.1	5.9
$1,300–$1,399	10.8	18.3	7.5	11.5	17.9	5.2
$1,400–$1,499	14.0	43.4	2.0	5.0	36.4	5.8
$1,500–$1,599	9.7	27.1	1.0	6.4	18.8	5.6
$1,600–$1,699	4.2	2.5	2.5	4.1	7.6	3.6
$1,700–$1,799	3.3	.8	2.1	6.8	.9	3.6
$1,800–$1,899	2.4	----	.3	.9	.2	2.8
$1,900–$1,999	1.8	.4	.5	3.2	1.8	2.5
$2,000–$2,099	2.6	.3	.6	----	.4	1.9
$2,100–$2,199	.6	----	.4	----	----	1.8
$2,200–$2,299	.4	----	.1	.2	----	.8
$2,300–$2,399	.3	----	.2	----	----	1.2
$2,400–$2,499	.3	----	----	----	.2	.8
$2,500–$2,599	.1	----	----	.3	----	.3
$2,600–$2,699	.2	----	----	----	----	.8
$2,700–$2,799	.2	----	----	----	----	.3
$2,800–$2,899	.1	----	.1	----	----	.3
$2,900–$2,999	----	----	----	----	----	.1
$3,000 and over	.3	----	----	----	----	.8

[4] The complete classified tables for each of the 12 industries, including numbers of establishments and wage earners and cumulative percentages, are given in Table H in Pt. VI.

TABLE 119.—CLASSIFIED ACTUAL EARNINGS, PER CAPITA, IN 1919, BY INDUSTRIES: PER CENT DISTRIBUTION OF WAGE EARNERS ACCORDING TO PER CAPITA EARNINGS IN ESTABLISHMENT IN WHICH THEY WERE EMPLOYED—Con.

[Based on establishment schedules from 7 cities]

ANNUAL PER CAPITA EARNINGS	Foundry and machine-shop products	Furniture	Iron and steel, steel works and rolling mills	Mineral and soda waters	Printing and publishing, newspapers and periodicals	Slaughtering and meat packing	Tobacco, cigars and cigarettes
Total number of establishments	1,477	663	54	294	447	74	1,205
Total number of wage earners	76,177	14,258	38,313	1,846	2,531	1,284	24,944
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than $300	.2	.5	2.4	.5	.1	.1	2.0
$300–$399		.6		.1	.2		.6
$400–$499	.1	.3		1.6	.1	.1	8.9
$500–$599	.6	.2	1.7	1.2	.4		24.0
$600–$699	.6	2.1		2.1	1.0		14.2
$700–$799	.7	2.1	4.7	4.9	4.0	.9	15.2
$800–$899	2.7	10.9	.2	8.2	1.9	4.0	12.8
$900–$999	7.7	9.0	1.4	10.1	2.7	.5	5.0
$1,000–$1,099	10.4	11.7	2.0	16.1	5.6	11.0	5.3
$1,100–$1,199	9.7	8.2	4.7	21.1	3.7	6.8	3.7
$1,200–$1,299	19.7	13.3	2.7	7.9	5.8	5.2	1.8
$1,300–$1,399	9.2	11.5	12.8	8.9	15.1	6.0	1.2
$1,400–$1,499	12.9	8.3	13.5	7.4	20.4	7.6	3.7
$1,500–$1,599	9.6	8.2	10.4	2.3	11.1	28.5	.3
$1,600–$1,699	6.3	3.4	9.0	.5	3.7	6.0	.5
$1,700–$1,799	5.0	3.0	4.8	1.0	6.1	8.1	.2
$1,800–$1,899	1.6	2.1	8.0	1.6	8.2	2.0	.5
$1,900–$1,999	1.5	.8	1.2	.3	5.3	1.1	.1
$2,000–$2,099	.5	1.2	20.5	.6	.8	4.3	
$2,100–$2,199	.1	.9		1.3	1.2		
$2,200–$2,299	.3	.2		1.4	.3	.9	
$2,300–$2,399	.2	.3		.4	.2	.6	
$2,400–$2,499	.1	.2		.3	.6		
$2,500–$2,599		.2		.2	.3	.1	
$2,600–$2,699	.1				.1		
$2,700–$2,799	.1	.1				4.3	
$2,800–$2,899					.2		
$2,900–$2,999		.3				1.0	
$3,000 and over	.1	.4			.9	.9	

The eight cities covered in the 1919 inquiry are separately reported as to the percentage distribution of their establishments in respect to per capita earnings in Table 120.[5] There is naturally less difference between the cities in respect to variation than between the different industries, inasmuch as the figures for each city represent the consolidation of the widely variant industries shown in Table 119. Moreover, such differences as are visible between the cities are probably in part attributable to the prominence of certain industries in those cities. For example, it would appear that there is a greater degree of uniformity of earnings in Detroit than is true of the eight cities combined or, than is true of, say, San Francisco. This is probably due to the great prominence of the automobile industry in Detroit. Similarly, no doubt, the relatively greater variability of earnings in New York may be accounted for by the importance of the women's clothing trade in that city.

[5] The complete frequency tables for each of the 8 cities, including numbers of establishments and wage earners and cumulative percentages, are given in Table I in Pt. VI.

TABLE 120.—CLASSIFIED ACTUAL EARNINGS, PER CAPITA, IN 1919, BY CITIES

[Based on census schedules for 20 industries in these cities]

ANNUAL PER CAPITA EARNINGS	Eight cities combined	Boston	Chicago	Cleveland	Detroit	New York	Pittsburgh	San Francisco	St. Louis
Total number of establishments	12,103	580	1,734	550	397	7,524	360	427	521
Total number of wage earners	523,846	27,299	96,857	59,234	67,596	185,410	46,723	9,630	31,097
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than $300	.8	.1	.1	.1	.6	1.2	2.0	.5	.1
$300–$399	.4	.2	.1			.7	.2	.6	.3
$400–$499	1.0	.4	.5	.1	.1	1.8	.9	2.0	.7
$500–$599	2.9	1.3	1.7	2.0	.2	5.0	.7	4.3	1.4
$600–$699	3.3	2.1	2.0	1.6	1.9	4.3	1.3	1.9	7.5
$700–$799	6.7	19.8	2.6	3.1	2.5	7.4	5.4	8.1	9.2
$800–$899	6.4	9.6	5.2	4.9	3.9	5.9	3.0	7.2	20.1
$900–$999	6.1	7.7	5.5	6.5	.8	6.7	2.5	14.2	15.2
$1,000–$1,099	7.1	7.2	7.1	3.6	1.9	11.2	.9	5.7	9.6
$1,100–$1,199	5.9	9.0	10.5	5.1	2.3	7.1	4.3	5.6	8.2
$1,200–$1,299	8.2	13.5	22.6	9.5	7.5	8.2	4.8	8.1	6.9
$1,300–$1,399	10.8	11.0	11.8	14.4	17.2	7.5	15.2	10.8	3.5
$1,400–$1,499	14.0	4.9	8.1	17.3	26.6	8.7	22.6	5.1	8.9
$1,500–$1,599	9.7	3.2	7.2	11.9	22.2	6.6	9.0	12.3	4.0
$1,600–$1,699	4.3	2.8	3.5	11.1	3.6	3.1	3.1	3.0	2.2
$1,700–$1,799	3.3	1.9	2.1	1.8	3.9	3.5	6.2	2.5	1.0
$1,800–$1,899	2.4	1.7	1.6	4.2	1.5	2.6	2.4	2.5	.3
$1,900–$1,999	1.8	2.9	6.4	1.0	2.5	2.1	.1	.1	.6
$2,000–$2,099	2.6		.5	1.7	.3	1.4	15.3	.4	.1
$2,100–$2,199	.6	.1	.3		.1	1.2		3.1	.1
$2,200–$2,299	.4	.3	.1		.1	.6		.2	
$2,300–$2,399	.3		.2	.1		.8	.1	.3	
$2,400–$2,499	.3		.1		.3	.5		.2	.1
$2,500–$2,599	.1					.3			
$2,600–$2,699	.2					.4			
$2,700–$2,799	.2					.3		.2	
$2,800–$2,899	.1	.3	.1			.2		.4	
$2,900–$2,999			.1			.1		.1	
$3,000 and over	.3					.6		.6	

VARIABILITY IN TERMS OF STANDARD DEVIATION

The facts about variability of earnings which have appeared in the preceding tables of this chapter in more or less discursive form can be set out much more briefly by calculating for the different city and industry groups the standard or typical deviation and the corresponding coefficient of variation for each group. The standard deviation, which is the square root of the mean square of the deviations of the individual (establishment per capita) rates of wages from the average (establishment) rate, has been worked out here on the basis of the following formulae:[6]

$$\sigma = \sqrt{\frac{\Sigma f d^2}{n} - c^2}$$

$$c = \frac{\Sigma f d}{n}$$

[6] An example of the way in which these formulae are applied to our data, in order to get the results shown in Tables 121 and 122, is given in Table 170, p. 372, which uses as its basic material the frequency distribution of wage earners (actual time) in Table 118.

Where

σ = Standard deviation.
d = Deviation from assumed average.
f = Class frequencies (numbers of wage earners).
n = Total number of wage earners.
c = Correction for error in assumed average.[7]

The standard deviation is, of course, an absolute sum, not a percentage. Consequently, for purposes of comparison, coefficients of variation have been computed. The coefficient of variation is the standard deviation expressed as a percentage of the arithmetic mean. The formula is:

$$V = \frac{\sigma}{M} \times 100$$

in which V = Coefficient of variation
and M = Weighted arithmetic mean (of establishment per capita earnings items).

The standard deviation, as already stated, is a sum in dollars representing the typical deviation in earnings from the average earnings. Since it would be meaningless to compare this deviation in an industry where the average earnings are high with the deviation in an industry where the average earnings are very much lower, it is put in a form which makes it more possible to compare one industry with another by expressing it as a percentage of the average. In other words, coefficients of variations are derived from the standard deviations by dividing the latter by the average. The coefficient of variation, then, is the quotient of the standard deviation divided by the average, multiplied by 100. To illustrate, the standard deviation worked out by application of the above formula for all 20 industries combined was $426. This is the deviation from the average of $1,272, the average being a weighted arithmetic mean calculated from the same classified data which were used for the calculation of the standard deviation. This standard deviation of $426, divided by the average wage of $1,272, gives a coefficient of variation of 33.5 per cent.

Standard deviations and their corresponding coefficients of variations for each of the eight cities and for all of them combined (without Chicago) are shown in Table 121. Alongside the standard deviations are listed the average money earnings from which the deviations are measured. Again, illustrating by use of the figures for the seven cities combined, which is the same thing, of course, as to say for the 20 industries combined, we have a standard deviation of $426 from an average of $1,272. This means that, in 1919 in the

[7] Since it has been necessary to calculate the standard deviation from classified earnings tables, we are under the necessity of using an assumed average for our point of departure in the calculation.

establishments included in the sample, the typical variation from the average was $426, the typical variation being an amount almost exactly one-third of the average; that is to say, its coefficient of variation was 33.5 per cent.

TABLE 121.—STANDARD DEVIATIONS AND COEFFICIENTS OF VARIATION BASED ON CLASSIFIED WAGE TABLES FOR EACH OF 8 CITIES, FOR 20 INDUSTRIES: 1919

CITY	Median establishment average	Average actual money earnings (based on 7 cities for 20 industries)	Standard deviation from average in preceding column	Coefficient of variation
Seven cities	[1] $1,316	[2] $1,272	[2] 426	[2] 33.5
Boston	1,105	1,129	356	31.6
Chicago	1,243	1,415	344	24.3
Cleveland	1,389	1,343	325	24.2
Detroit	1,424	1,399	283	20.3
New York	1,184	1,225	490	40.1
Pittsburgh	1,433	1,423	410	28.8
San Francisco	1,194	1,215	453	37.3
St. Louis	958	1,042	306	29.4

[1] Including Chicago, 8 cities. [2] Chicago excluded.

Corresponding standard deviation figures and variation coefficients for each of the 12 industries and for the consolidated group of 20 industries combined are given with the corresponding averages in Table 122. For purposes of comparison the averages calculated

TABLE 122.—STANDARD DEVIATIONS AND COEFFICIENTS OF VARIATION BASED ON CLASSIFIED WAGE TABLES FOR EACH OF 12 INDUSTRIES IN 7 CITIES: 1919

INDUSTRY	AVERAGE ACTUAL MONEY EARNINGS			Standard deviation from average in preceding column	Coefficient of variation (per cent)
	Based on all manufacturing industries reported by Census Bureau		Based on special study of 20 industries in 7 cities		
Twenty industries (in 7 cities)[1]		$1,212	[2] $1,272	$427	33.6
	Men	*Women*			
Automobiles	1,278	----------	1,456	170	11.7
Boots and shoes, not including rubber boots and shoes	1,342	859	1,016	312	30.7
Brass, bronze, and copper products	----------	----------	1,202	379	31.5
Clothing, women's	1,586	838	1,227	539	44.0
Foundry and machine-shop products	1,450	----------	1,322	300	22.7
Furniture	1,192	----------	1,253	380	30.3
Iron and steel, steel works and rolling mills	1,728	----------	1,526	422	27.6
Mineral and soda waters	866	440	1,160	347	29.9
Printing and publishing, newspapers and periodicals	1,330	599	1,466	1,311	82.7
Railroad repair shops, steam	1,394	----------	1,392	255	18.3
Slaughtering, wholesale, not including meat packing	1,484	----------	1,544	447	28.9
Tobacco, cigars and cigarettes	907	504	758	285	37.6

[1] Boston, Cleveland, Detroit, New York, Pittsburgh, San Francisco, and St. Louis.
[2] Calculated from frequency distribution in Table 118.

from the whole of manufacturing industry, as presented in detail in earlier chapters of this book, are also included. The results shown in this table, of course, indicate a wide variation between the different industries as to the degree of uniformity of earnings therein. On the whole they confirm what has already been brought out in a more general way. In this form the figures have the advantage of telling the story in a nutshell. Again, it appears that the automobile industry, foundry and machine-shop products, and steam-railroad repair shops are industries having a relatively high degree of uniformity in earnings, whereas women's clothing, and tobacco, cigars and cigarettes and, possibly, printing seem to have a relatively low degree of uniformity in earnings.

Chapter XI

CHANGES IN VARIABILITY BETWEEN 1899 AND 1919

The classified wage tables in the Dewey report, covering the census years 1890 and 1899 (1900), and similar classified wage tables reported in Census Bulletin 93 for the manufactures census year 1904, furnish the necessary data for making a comparison with the results reached in the special analysis here made for the year 1919. The details of the method of effecting what is the equivalent to the deflation of the nominal earnings of the different periods are given in Chapter XX. A comparison between classified wage distributions in 1890, 1900, 1904, and 1919 is made in Table 123. In the left-hand part of the table the distribution of wage earners is in accordance with nominal wage sums. On the right-hand side of the table two comparisons are made: One between the distribution in 1900 and 1919; the other between the distribution of 1904 and 1919. In these two distributions the numbers of wage earners are distributed according to amounts of their real wages on the basis of the two earlier periods. In the case of the first comparison, that is to say, on the 1900 basis; in the case of the second comparison on the 1904 basis. In both cases percentage distribution figures are given.

Comparison of frequency distributions: 1890 to 1919

The more general term "wages" has been used in the preceding paragraph instead of the term "earnings." This has been done deliberately because of the (for us) unfortunate fact that the classified tables for 1890, 1900, and 1904 are not built upon exactly the same kind of wage data as are our tables for 1919. In Table 123 the frequency tables for 1890 and 1900 are based upon rates per week. Those for 1904 are based upon earnings per week. The frequency tables for 1919 are based upon earnings per week; and these earnings are not earnings of individual wage earners but, as has been explained, upon the per capita earnings received by the employees of individual establishments. The classifications of the weekly rates of the two earliest years and the weekly earnings of the year 1904 have been compressed at certain points, in order to put them in a form comparable with the later classifications. The weekly brackets multiplied by 50 (here assuming the earnings of the full year's work to be equivalent to 50 times the earnings received in the one week reported) are shown on the right-hand side of the stub. Of course,

it is not assumed that this rather free translation of weekly brackets into equivalent annual brackets is free from error, possibly serious error, but it is believed that, for purposes of showing large outstanding contrasts in the distribution of earnings, the results are not without some value. It is also obvious that the significant comparisons are to be made between the two pairs of percentage

TABLE 123.—COMPARISON BETWEEN CLASSIFIED WAGE DISTRIBUTIONS IN 1890, 1899, 1904, AND 1919

WAGES		NUMBER OF WAGE EARNERS							
		Comparison based on current prices				Comparison based on purchasing power of 1900 dollar		Comparison based on purchasing power of 1904 dollar	
Weekly amounts	Equivalent yearly amounts	1890 [1] A	1900 [1] B	1904 C	1919 D	1900	1919 [2]	1904	1919 [3]
	Total	104,923	160,055	3,297,819	426,989	160,055	426,989	3,297,819	426,989
Less than $3	Less than $150	444	591	132,064	216	591	1,708	132,064	1,708
$3–$4	$150–$199	2,329	2,646	150,403	83	2,646	2,988	150,403	1,281
$4–$5	$200–$249	3,723	4,331	194,301	132	4,331	11,099	194,301	5,550
$5–$6	$250–$299	2,735	3,880	206,163	452	3,880	26,468	206,163	13,234
$6–$7	$300–$349	6,435	7,926	262,531	401	7,926	35,006	262,531	28,602
$7–$8	$350–$399	9,529	15,727	266,012	296	15,727	36,713	266,012	31,164
$8–$9	$400–$449	8,184	13,233	255,458	791	13,233	34,152	255,458	33,725
$9–$10	$450–$499	12,372	23,686	378,009	829	23,686	37,994	378,009	30,737
$10–$12	$500–$599	18,750	25,375	439,208	7,053	25,375	136,181	439,208	80,257
$12–$15	$600–$749	18,244	31,403	464,875	23,402	31,403	67,450	464,875	142,157
$15–$20	$750–$999	15,422	23,384	390,367	62,231	23,384	28,602	390,367	50,374
$20–$25	$1,000–$1,249	3,913	4,427	106,700	70,950	4,427	3,415	106,700	5,977
$25 and over	$1,250 and over	2,843	3,446	51,728	260,063	3,446	854	51,728	2,134
		PER CENT DISTRIBUTION							
	Total	100.00	100.00	100.0	100.0	100.0	100.0	100.0	100.0
Less than $3	Less than $150	.42	.37	4.0	.1	.4	.4	4.0	.4
$3–$4	$150–$199	2.22	1.66	4.6	-------	1.7	.7	4.6	.3
$4–$5	$200–$249	3.55	2.71	5.9	-------	2.7	2.6	5.9	1.3
$5–$6	$250–$299	2.61	2.43	6.2	.2	2.4	6.2	6.2	3.1
$6–$7	$300–$349	6.13	4.95	8.0	.2	5.0	8.2	8.0	6.7
$7–$8	$350–$399	9.10	9.83	8.1	.1	9.8	8.6	8.1	7.3
$8–$9	$400–$449	7.80	8.27	7.7	.2	8.3	8.0	7.7	7.9
$9–$10	$450–$499	11.79	14.80	11.5	.2	14.8	8.9	11.5	7.2
$10–$12	$500–$549	17.87	15.83	13.3	1.6	15.8	31.9	13.3	18.8
$12–$15	$600–$749	17.38	19.62	14.1	5.5	19.6	15.8	14.1	33.3
$15–$20	$750–$999	14.70	14.61	11.8	14.6	14.6	6.7	11.8	11.8
$20–$25	$1,000–$1,249	3.73	2.78	3.2	16.7	2.8	.8	3.2	1.4
$25 and over	$1,250 and over	2.70	2.14	1.6	60.8	2.1	.2	1.6	.5

[1] Data from H. L. Moore, "The variability of wages," 22 Political Science Quarterly, 67. This article is a summary of the Census data in the Dewey report on "Employees and wages."
[2] Each establishment average wage on tally sheet divided by 2.63 (cost of living index) before making frequency table.
[3] Tally sheet figures divided by 2.35 before making frequency table.

distribution columns in the lower right-hand corner of the table. These percentage distributions represent a comparison between 1919 and 1900 or 1904, as the case may be, in respect to the distribution of real earnings for all industries combined. Thus the first pair of percentage columns representing 1900 and 1919 indicates that in the latter year 32 per cent of the 427,000 wage earners covered

by the figures were employed in establishments paying per capita earnings which had a 1900 purchasing power value of between $500 and $550. In 1900, 16 per cent of the 160,000 employees in the 30 industries covered by the Dewey report received earnings also having a purchasing power in that year between $500 and $550. The 1900–1919 comparison does not bring out any very marked difference in variability of wages between the two periods. It is true that there is a greater concentration around the mode in 1919 but this seems to be compensated for, to a degree, by the fact of larger proportions in that year in the lower wage brackets; that is, the brackets higher up in the column. No very different result appears from the comparison between 1904 and 1919. In making the frequency distributions in Table 123, where comparisons are made on the basis of uniform purchasing power, the establishment per capita earnings items on the tally sheets for 1919 were divided by cost of living factors—2.63 for the 1900 comparison and 2.35 for the 1904 comparison—before making the frequency table.[1]

Each of the 12 industries shown in Table 122 is reported separately in Table 126 in a form similar to that of the percentage distributions in the lower right-hand corner of Table 123. There is, however, this difference between the two tables: For each of the 12 industries in Table 126 two percentage distributions are given for 1919—one the percentage distribution on the basis of nominal earnings in 1919, the other the distribution on the deflated basis used in the percentage distributions in Table 123; that is to say, on the basis of the purchasing power of 1919 money wages in the earlier year of the comparsion. The heavy bunching of the percentages in the case of the nominal distribution for 1919 shows how very misleading it would be to try to compare frequency distributions of money wages in 1904 with similar distributions of money wages in 1919. The two comparable columns are, of course, the first two of the three columns shown for each industry. In some cases the percentages for the earlier year are for male wage earners only, and in the later year for male and female workers combined; in other cases the reverse is true. This condition, no doubt, diminishes the comparability of the data. It is important to note, on the other hand, that where 1899 (1900) is the earlier year in the comparison, the figures used are taken from Mr. Dewey's tables of earnings and not from his tables of rates.

CHANGES IN VARIABILITY DURING 30 YEARS

In Table 124 a comparison is made between the coefficients of variation for actual yearly earnings in 1919, full-time yearly earnings

[1] The data for the years 1890 and 1900 are not taken directly from the census volume on Employees and Wages, which embodies the Dewey report, but from a summary of that report made by H. L. Moore in an article entitled "The variability of wages" (22 Political Science Quarterly, 67).

in 1919, average weekly earnings in 1904, and average weekly rates in 1899 (1900) and 1890. The table also presents in the second column the standard deviations, which, in the case of the 1919 data, are worked out both on the basis of full-time and actual earnings and, for the three earlier years, on the basis of the yearly amounts estimated to be roughly equivalent to the standard deviations calculated upon the basis of the weekly rates or earnings for those years, respectively. More precisely, the deviation for yearly rates is assumed to be 51 times the deviation calculated on the basis of weekly rates; so also the deviations for earnings for 1904 are assumed to be 51 times those for weekly earnings. This latter estimate especially is probably widely in error, yet it is reassuring that the separate calculations of standard deviations for 1919 on the actual and full-time earnings bases produced very little difference in the resulting figures for standard deviation.

TABLE 124.—STANDARD DEVIATIONS AND COEFFICIENTS OF VARIATION, ALL INDUSTRIES COMBINED: 1890, 1899, 1904, AND 1919 [1]

YEAR	STANDARD DEVIATION		Coefficient variation [3]
	Based on weekly wages	Based on yearly wages [2]	
1890 [4]	$5.31	$271	45.9
1899 [4]	5.02	256	43.5
1904 [5]	3.08	157	30.6
1919 [6]	----------	425	31.6
1919 [7]	----------	426	33.5

[1] Figures for 1890 and 1900 (1899) taken from H. L. Moore "Variability of wages" 22 Political Science Quarterly 66. Figures for 1904 computed from classified wage table in Census Bull. 93, p. 11.
[2] Estimated for 1890, 1899, and 1904 by multiplying the deviation figures in the first column by 51.
[3] Standard deviation divided by average wages, multiplied by 100.
[4] Based on average weekly rates for 30 selected industries.
[5] Based on average weekly earnings for 338 industries.
[6] Based on average annual full-time earnings for 20 selected industries.
[7] Based on average annual actual earnings for 20 selected industries.

Even with the standard deviations thus quite crudely put on an annual basis, they are not in a form in which they can be compared one with another. The only form in which they can be compared is that of the coefficient of variation obtained by dividing each one of them by the average. These coefficients seem to indicate a very large drop in the variability of wages between 1899 and 1904, followed during a longer period to 1919 by a slight rise, this rise being more pronounced if the coefficient based on actual earnings be taken rather than the one based upon full-time earnings. It may be said that the decline between 1899 and 1904 is apparent only and is the result of the fact that the 1899 data are based on rates, whereas those of 1904 are based on earnings. There would be more to be said for such a supposition if the rates and earnings in the two periods were *annual* rates and earnings. Certainly, there would seem to be a wide difference between variation in annual rates and variation in annual

earnings, but it does not seem likely that there would be so great a difference between full-time weekly earnings (that is to say, weekly rates) and actual weekly earnings. That this difference is very slight seems to be indicated by the results of our separate calculations of the standard deviation from the 1919 data. The standard deviation, computed from full-time earnings (annual rates) is $425; the corresponding standard deviation, computed from actual yearly earnings, is $426; the two coefficients of variation corresponding to these standard deviations are 31.6 and 33.5. Now, if there is no more difference than this between a standard deviation based, respectively, on full-time and actual yearly earnings, it would seem likely that the difference could hardly be greater when the standard deviations are calculated from full-time and actual earnings data reported on a weekly basis.

INDUSTRY CHANGES IN VARIABILITY

The coefficients of variation for each of the industries separately reported in the special inquiry for 1919 are compared in Table 125 with corresponding coefficients for the same industries in the three earlier periods. The coefficients for 1904 were calculated from the data in Census Bulletin 93. The coefficients for 1890 and 1899 (1900) are taken from Mr. Moore's calculations which in turn are based upon the Dewey report. The figures by industries bear out in a very general way the consolidated coefficients shown in the preceding table. They indicate on the whole diminishing variation in wages;

TABLE 125.—COEFFICIENTS OF VARIATION, BY INDUSTRIES: 1890, 1899, 1904, AND 1919 [1]

INDUSTRY	1890	1899	1904	1919
All industries [2]	45.9	43.5	30.6	33.5
Automobiles			15.3	11.7
Boots and shoes, not including rubber boots and shoes	44.2	41.1	23.7	30.7
Brass, bronze, and copper products				31.5
Clothing, women's [3]	53.2	59.3	18.8	44.0
Foundry and machine-shop products [4]	41.7	40.0	21.6	22.7
Furniture	42.8	43.8	25.6	30.3
Iron and steel, steel works and rolling mills [5]	53.1	52.1	19.8	27.6
Mineral and soda waters			27.5	29.9
Printing and publishing, newspapers [6]	45.7	47.3	25.3	82.7
Railroad repair shops, steam [7]	36.9	36.6	18.0	18.3
Slaughtering, wholesale, not including meat packing [8]	30.7	29.5	13.6	28.9
Tobacco, cigars and cigarettes [9]	49.0	54.8	26.4	37.6
Cigars	48.6	44.4		

[1] Coefficients for 1890 and 1899 (1900) from H. L. Moore, op. cit., p. 72-73; for 1904 for the separate industries from Bull. 93 (based on earnings of *men* only).
[2] For 1890 and 1899 the "all industries" figure includes 30 industries covered in the Dewey report; for 1904, it covers all industries; for 1919, the 20 industries, in seven cities, included in variability study.
[3] Figures for 1890 and 1899 are for "Clothing."
[4] Figures for 1890 and 1899 are for "Foundries."
[5] Figures for 1890 and 1899 are for "Iron and steel."
[6] Figures for 1890 and 1899 are for "Printing."
[7] Figures for 1890 and 1899 are for "Car and railroad shops."
[8] Figures for 1890 and 1899 are for "Slaughtering."
[9] Figures for 1890 and 1899 are for "Tobacco."

that is to say, they seem to indicate that there is a tendency toward greater uniformity in earnings, but this tendency is made somewhat doubtful by the fact that during the 15 years from 1904 to 1919 there has been an apparent increase in variability. In some industries this increase has been very large. It appears that between 1899 and 1904 every industry listed experienced a fall in the variability of the earnings received by its employees. At least this is true

TABLE 126.—COMPARISON OF PURCHASING POWER OF WAGES BETWEEN 1904 AND 1919, AND BETWEEN 1899 AND 1919, BY MEANS OF DEFLATED PERCENTAGE DISTRIBUTIONS OF NUMBER OF WAGE EARNERS RECEIVING CLASSIFIED AMOUNTS

WAGE CLASS [1]		MINERAL AND SODA WATERS			FURNITURE		
Weekly basis	Annual basis	1904	1919 (deflated to 1904 prices)	1919 (money wages)	1904	1919 (deflated to 1904 prices)	1919 (money wages)
Number of wage earners		*M. and F.* 9,059	*M. and F.* 1,846	*M. and F.* 1,846	*M. and F.* 53,715	*M.* 14,258	*M.* 14,258
Total		100.0	100.0	100.0	100.0	100.0	100.0
Less than $3	Less than $150	1.4			1.7		
$3–$4	$150–$199	3.4	.2		2.3	.2	
$4–$5	$200–$249	4.6	.6		3.9	.1	.1
$5–$6	$250–$299	5.2	2.4		4.5	1.6	
$6–$7	$300–$349	9.1	4.6		7.4	2.4	
$7–$8	$350–$399	7.0	12.5		10.5	11.5	.2
$8–$9	$400–$449	6.2	12.7		9.8	16.6	
$9–$10	$450–$499	12.8	21.6	.2	13.7	7.8	
$10–$12	$500–$599	17.8	26.5	.7	15.2	25.8	.1
$12–$15	$600–$749	19.4	11.8	2.8	17.4	24.1	2.1
$15–$20	$750–$999	10.9	6.5	20.2	11.1	8.3	20.0
$20–$25	$1,000–$1,249	1.6	.6	41.6	2.0	1.0	21.4
$25 and over	$1,250 and over	.6		34.5	.5	.5	56.1

WAGE CLASS [1]		PRINTING AND PUBLISHING, NEWSPAPERS			IRON AND STEEL, STEEL WORKS AND ROLLING MILLS		
Weekly basis	Annual basis	1904	1919 (deflated to 1904 prices)	1919 (money wages)	1904	1919 (deflated to 1904 prices)	1919 (money wages)
Number of wage earners		*M.* 49,642	*M. and F.* 25,531	*M. and F.* 25,531	*M.* 117,374	*M.* 38,313	*M.* 38,313
Total		100.0	100.0	100.0	100.0	100.0	100.0
Less than $3	Less than $150	3.4			1.1		
$3–$4	$150–$199	3.5			1.2		
$4–$5	$200–$249	3.8			1.4	2.4	
$5–$6	$250–$299	4.3	1.3		2.1	1.7	
$6–$7	$300–$349	6.1	4.1		3.8	2.6	
$7–$8	$350–$399	4.9	2.8	.2	7.9		
$8–$9	$400–$449	4.8	2.4		12.5	2.3	
$9–$10	$450–$499	6.8	6.2	.1	13.3	2.0	
$10–$12	$500–$599	12.0	22.9	.4	17.9	13.0	.6
$12–$15	$600–$749	15.0	37.6	4.3	15.9	33.0	1.4
$15–$20	$750–$999	16.5	20.2	5.2	12.7	43.9	3.5
$20–$25	$1,000–$1,249	9.2	1.4	10.3	4.6		5.3
$25 and over	$1,250 and over	9.7	.9	79.5	5.6		89.2

[1] Classified wage distributions for 1899 and 1900 based on "earnings in a week"; for 1904, for earnings in "busiest week"; for 1919, on "establishment-per capita-averages" of "full-time" earnings.

TABLE 126.—COMPARISON OF PURCHASING POWER OF WAGES BETWEEN 1904 AND 1919, AND BETWEEN 1899 AND 1919, BY MEANS OF DEFLATED PERCENTAGE DISTRIBUTIONS OF NUMBER OF WAGE EARNERS RECEIVING CLASSIFIED AMOUNTS—Continued

WAGE CLASS [1]		FOUNDRY AND MACHINE-SHOP PRODUCTS			AUTOMOBILES		
Weekly basis	Annual basis	1904	1919 (deflated to 1904 prices)	1919 (money wages)	1904	1919 (deflated to 1904 prices)	1919 (money wages)
Number of wage earners		M. 242,845	M. 76,177	M. 76,177	M. 13,805	M. 45,926	M. 45,926
Total		100.0	100.0	100.0	100.0	100.0	100.0
Less than $3	Less than $150	1.4			.6		
$3–$4	$150–$199	1.9	.2		.5		
$4–$5	$200–$249	2.6	.5		1.0		
$5–$6	$250–$299	2.8	.4	.1	1.1		
$6–$7	$300–$349	4.3	.9	.1	2.0	1.4	
$7–$8	$350–$399	6.1	2.8		3.3	.4	
$8–$9	$400–$449	7.6	10.5		4.0	.6	
$9–$10	$450–$499	12.7	8.9		12.2	1.1	
$10–$12	$500–$599	15.0	29.5	.2	20.8	15.6	
$12–$15	$600–$749	18.7	39.4	1.1	24.1	79.7	
$15–$20	$750–$999	21.1	6.3	6.1	24.0	1.2	1.8
$20–$25	$1,000–$1,249	4.5	.4	27.3	4.4		2.6
$25 and over	$1,250 and over	1.3	.2	65.1	1.4		95.6

WAGE CLASS [1]		TOBACCO, CIGARS AND CIGARETTES [2]				CLOTHING, WOMEN'S [3]		
Weekly basis	Annual basis	1900 (earnings)		1919 (deflated to 1904 prices)	1919 (money wages)	1900	1919 (deflated to 1904 prices)	1919 (money wages)
Number of wage earners		M. 1,762	F. 1,490	M. and F. 24,944	M. and F. 24,944	F. 1,240	M. and F. 109,251	M. and F. 109,251
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than $3	Less than $150	1.5	5.9	.1		7.3	.6	
$3–$4	$150–$199	1.9	10.0	2.9		11.9	1.7	.1
$4–$5	$200–$249	2.5	17.1	15.3	.1	16.1	4.4	
$5–$6	$250–$299	1.9	20.2	26.4		19.3	8.4	
$6–$7	$300–$349	3.7	15.2	18.6		16.8	9.8	.4
$7–$8	$350–$399	5.7	10.2	9.8		11.6	11.0	.2
$8–$9	$400–$449	6.3	7.5	10.6	1.2	7.3	11.6	.4
$9–$10	$450–$499	7.6	4.9	6.7	.7	4.6	8.5	.5
$10–$12	$500–$599	12.2	6.1	7.3	12.0	3.1	14.7	2.4
$12–$15	$600–$749	19.0	2.6	2.2	23.3	1.7	15.0	8.1
$15–$20	$750–$999	27.0	.3	.1	32.5		11.0	19.4
$20–$25	$1,000–$1,249	6.4			18.7	.1	2.7	20.8
$25 and over	$1,250 and over	4.2			10.5		.6	47.7

[1] Classified wage distributions for 1890 and 1900 based on "earnings in a week"; for 1904, for earnings in "busiest week"; for 1919, on "establishment-per capita-averages" of "full-time" earnings.
[2] 1900, "cigars."
[3] 1900, "clothing."

TABLE 126.—COMPARISON OF PURCHASING POWER OF WAGES BETWEEN 1904 AND 1919, AND BETWEEN 1899 AND 1919, BY MEANS OF DEFLATED PERCENTAGE DISTRIBUTIONS OF NUMBER OF WAGE EARNERS RECEIVING CLASSIFIED AMOUNTS—Continued

WAGE CLASS [1]		BOOTS AND SHOES			
Weekly basis	Annual basis	1900		1919 (deflated to 1904 prices)	1919 (money wages)
Number of wage earners		*M.* 2,092	*F.* 1,334	*M. and F.* 29,362	*M. and F.* 29,362
Total		100.0	100.0	100.0	100.0
Less than $3	Less than $150	.2	1.1		
$3–$4	$150–$199	.6	3.9	.3	
$4–$5	$200–$249	.9	5.9	.5	
$5–$6	$250–$299	2.1	8.7	9.4	
$6–$7	$300–$349	2.5	10.1	31.4	
$7–$8	$350–$399	3.9	10.6	20.2	
$8–$9	$400–$449	3.7	11.6	8.1	.1
$9–$10	$450–$499	7.0	12.7	8.0	.1
$10–$12	$500–$599	13.9	18.8	13.3	.6
$12–$15	$600–$749	26.2	12.4	6.7	8.2
$15–$20	$750–$999	24.3	4.0	1.8	42.8
$20–$25	$1,000–$1,249	8.9	.2	.3	22.2
$25 and over	$1,250 and over	5.8			26.0

WAGE CLASS [1]		SLAUGHTERING, WHOLESALE, NOT INCLUDING MEAT PACKING			STEAM-RAILROAD REPAIR SHOPS [4]		
Weekly basis	Annual basis	1904	1919 (deflated to 1904 prices)	1919 (money wages)	1900 (earnings)	1919 (deflated to 1904 prices)	1919 (money wages)
Number of wage earners		*M.* 2,815	*M.* 1,284	*M.* 1,284	*M.* 710	*M.* 21,521	*M.* 21,521
Total		100.0	100.0	100.0	100.0	100.0	100.0
Less than $3	Less than $150	.9	.1		.6		
$3–$4	$150–$199	.5	.1		.8		
$4–$5	$200–$249	.6			.2		
$5–$6	$250–$299	1.1	.8		.5		
$6–$7	$300–$349	1.6			.9	10.1	
$7–$8	$350–$399	2.5	10.1		.7		
$8–$9	$400–$449	2.2	7.7		.8	.6	
$9–$10	$450–$499	5.8	12.3	.2	4.5	4.8	
$10–$12	$500–$599	17.8	46.4		11.2	69.0	
$12–$15	$600–$749	29.1	15.6	.7	33.9	14.5	
$15–$20	$750–$999	25.4	6.0	1.6	38.3	1.0	9.1
$20–$25	$1,000–$1,249	7.8	.9	24.1	7.5		1.0
$25 and over	$1,250 and over	4.7		73.4	.1		89.9

[1] Classified wage distributions for 1890 and 1900 based on "earnings in a week"; for 1904, for earnings in "busiest week"; for 1919, on "establishment-per capita-averages" of "full-time" earnings.
[4] 1900, "car and railroad repair shops."

if the whole comparison is not invalidated because of the fact that one set of coefficients is based upon weekly earnings whereas the other is based upon weekly rates. Subject to the same reservation, it seems that between 1904 and 1919 nearly all of the industries showed an increase in variability. This increase, however, was not shared by the automobile industry. It was shared only slightly in the case of steam-railroad repair shops, where the change was from 18 to 18.3 per cent. In 1919, then, there seems to have been a much greater difference between industries in respect to variability of wages than at any earlier period.

Part V

METHOD

Chapter XII

WAGE STATISTICS IN THE UNITED STATES

The peculiar shortcomings of any inquiry into wages or earnings by census methods have made it necessary, in order to arrive at an approximate estimate of real earnings, to supplement the census material forming the foundation of this monograph with data from other official sources and, to some extent also, from certain authoritative private agencies. This varied assortment of sources relied upon in working out our results makes it desirable briefly to discuss the different agencies whose reports are utilized, in order to throw light upon the methods of collecting the original data, the scope and limitations of the figures reported and the differences between the various bodies of data. In addition to the Bureau of the Census, the following agencies have been drawn upon for supplementary data: United States Bureau of Labor Statistics, the New York State Department of Labor, the Massachusetts Department of Labor and Industry, the Illinois State Bureau of Labor Statistics, the Wisconsin Industrial Commission, the New Jersey Bureau of Labor Statistics, the Federal Reserve Board, and the Federal Reserve Bank of New York. The private agencies whose statistics have been utilized are: The National Bureau of Economic Research and the National Industrial Conference Board.[1]

Bureau of the Census

In the case of the Census Bureau, it is naturally necessary to examine somewhat more thoroughly the development of the statistics of wages which it has produced, as well as to characterize its present methods and point out certain limitations upon its data.[2]

It was just a little more than 100 years ago that the Census Bureau first included in its schedules for manufacturing establishments inquiries dealing with numbers of persons employed and amounts paid in wages. The first census of manufactures, taken in 1810, appears to have made no mention whatever of wages or wage earners. In the census of 1820 there were questions as to the number of men, women, and boys and girls, and an inquiry as to the amount annually

[1] For a list of sources used and cited in this monograph, see Appendix IV.

[2] In addition to the regular census publications, the writer has consulted and utilized in the preparation of this chapter the typewritten manuscript on Census Wage Statistics prepared for the Bureau of the Census by Mr. M. O. Lorenz.

paid in wages. No explanation is given as to whether the number of persons related to the average number, the greatest number, or the number on a certain date. The amount paid in wages is not given separately for sex and age groups. No census of manufactures was taken in 1830, but in 1840 the schedule asked for "the number of men employed" in various industries; there was, however, no inquiry in regard to wages.

It was in the census of 1850 that a definite effort seems first to have been made to ascertain the average earnings of persons engaged in manufacturing industries. The inquiry for this census called for "the average number of hands employed (males and females separately), the average monthly cost of male labor, and the average monthly cost of female labor." It is evident that there was no inquiry on the schedule as to the total amount of wages paid, although it seems likely that the returns in answer to the request for average monthly cost of labor was used as a basis for estimating the total annual amount of wages paid. The schedules contained the following stipulation: "The average number of hands and the average monthly wages are to be returned so that by dividing the latter by the former the result will show the average earnings of individuals." It was further stipulated that "In all cases where the employer boards the hands, the usual charge for board is to be added to the wages."[3]

The inquiries relating to employees and wages at the census of 1860 were virtually the same as those of 1850. In the published tabulation, wages are reported as "annual cost of labor," so that, as was the case in 1850, the average monthly cost items appear to have been aggregated to make an annual labor cost item.

A report of the total amount paid in wages during the year was requested for the first time in the Ninth Census (1870) and was repeated in the Tenth Census (1880). In 1870, as in the two preceding censuses, inquiry was made as to the average number of hands employed, and this inquiry was subdivided in order to get reports as to the average number of "males above 16 years; females above 15 years; and children and youth." In 1870 an inquiry was included, apparently for the first time, asking for the number of months in active operation.

In the text of the general report on the census of manufactures in 1880, there is nothing said about average wages or rates of wages. In the statistical tabulation, however, the total amount paid in wages is presented for all classes combined and the average number of hands employed is shown separately for men and for women and children, as in preceding census years. In connection with the

[3] The report on manufactures of the census of 1850 was published in March, 1859, as Sen. Ex. Doc., 35th Cong., 2d sess., No. 39.

census of 1880, a special investigation of wages was made, the results of which were compiled and described in a separate report by Mr. Joseph D. Weeks, special agent of the Census Bureau.[4]

The Weeks' report was limited to a presentation of the rates of wages of the most important classes of employees in 627 establishments in 53 of the more important manufacturing, mechanical, and mining industries. The report included in addition some further information bearing on intervals of payment, hours of labor, and regularity of employment. The original schedules used in this inquiry provided for a report as to the rates of wages over a series of years ending with 1880, and in some cases such rates were secured for a period of 30 years. The tables of the report show rates of wages by occupation, the rate prevailing in each occupation in each year reported, and the time unit of payment. In a number of cases the names of the operating companies are given.

In 1890 more attention was paid to the subject of wages than at any preceding census. Calculation of so-called "average wages" [5] was facilitated by publishing the number of wage earners and the total amount paid in wages in adjoining columns. The amounts of wages paid to men, women, and children are shown separately. This separation of amounts paid in wages by sex and age groups was continued in 1899 and in 1904; with the latter year, however, the practice was discontinued, and since then the amount paid in wages is not subdivided in respect to the sex and age of the wage earners to whom it is paid. This omission is of no little importance in connection with the present analysis, for the reason that if it had been possible to utilize for the period 1899 to 1925 the separate amounts paid to men, women, and children, respectively, it would have been more easily possible accurately to estimate the amounts of per capita earnings of women and children. Lacking this separation by sex and age groups, it becomes necessary to rely upon the assumption that the changes in the wages of women correspond closely to changes in the wages of men, and, resting on that assumption, to utilize as points of departure the amounts paid to men, women, and children separately in 1904 and reported in the special report on earnings of wage earners in Census Bulletin 93.

The census of 1890 (the Eleventh Census) was the occasion of an attempt to make a new departure in the method of reporting statistics of wages. An effort was made to ascertain by means of classified wage tables the actual distribution of wages among men, women, and children. This table called for the number of employees in each establishment who were paid specified weekly rates of wages running

[4] Report on the Statistics of Wages in the Manufacturing Industries. 1886. (571 pp.)

[5] Computed by dividing the amount paid in wages by the number of wage earners. (See initial paragraph, Ch. XIII, p. 269.)

from under $5 up to $25 and over, per week, and grouped in dollar intervals. The form of inquiry was as follows:

WEEKLY RATES OF WAGES PAID AND AVERAGE NUMBER OF HANDS EMPLOYED AT EACH RATE (NOT INCLUDING THOSE EMPLOYED ON PIECEWORK): 1890

RATES PER WEEK	Males above 16 years	Females above 16 years	Children
Under $5			
$5 and over, but under $6			
$6 and over, but under $7			
$7 and over, but under $8			
$8 and over, but under $9			
$9 and over, but under $10			
$10 and over, but under $12			
$12 and over, but under $15			
$15 and over, but under $20			
$20 and over, but under $25			
$25 and over			

The following comment upon this attempt to report wages in the form of classified frequency distributions is given in the summary and analysis of results appearing in the report of the Twelfth Census:[6]

> This is an ideal treatment of the wage question according to the matured statistical experience and experiment of many years in many bureaus and many countries. If it could have been successfully carried out it would have shown the actual number of employees in each wage group, and would have presented reliable approximations instead of the vague and meaningless average obtained by dividing the number of employees into the total amount of wages paid.

Unfortunately this effort was anything but a complete success. As stated in the report, "This classified method involved a statistical inquiry of such magnitude that it broke down of its own weight when the attempt was made to apply it to such an enormous volume of returns secured through the methods which the census must employ. Comparatively few of the enumerators in making their returns gave the necessary amount of time and attention to answering the complicated questions. The mass of returns was so defective in that respect that the Census Bureau abandoned any attempt to tabulate them for the country as a whole."[7]

A synopsis covering the period 1820 to 1890 and published in the reports of the manufactures census of 1905 is reproduced here as Table 127. It indicates the character of the inquiries made regarding employees and wages in all of the censuses from 1820 to 1890. The census periods since 1890 are all included within the scope of this present analysis, and for that reason they are given a somewhat different and more detailed description in another place. At this point it is only necessary to emphasize the fact that in respect to the

[6] Twelfth Census (1900), Vol. VII, Manufactures, Pt. I, p. cxii to cxiii.

[7] Returns from this inquiry were published, however, for the cities withdrawn from the enumerators, and appear with the statistics of cities in Pt. II of the report on manufactures of the Eleventh Census.

inquiries concerning the number of wage earners and the amount paid in wages, the census of 1899 (commonly referred to as the census of 1900) marks the beginning of a period which has now run to more than a quarter of a century, during which time it may truthfully be said that for the first time the statistics are strictly comparable as

TABLE 127.—PERSONS EMPLOYED, SALARIES AND WAGES: QUESTIONS USED ON THE GENERAL SCHEDULE AT CENSUSES OF 1820, 1840, AND ALL SUBSEQUENT CENSUSES UP TO 1890 [1]

[The "X" following the question and placed under the year signifies that the question was asked that year]

QUESTIONS ON SCHEDULE	1820	1840	1850	1860	1870	1880	1890
Amount paid annually in wages	X						
Average day's wages for an ordinary laborer						X	
Average day's wages for a skilled mechanic						X	
Average monthly cost of female labor			X	X			
Average monthly cost of male labor			X	X			
Average number of hands employed: Male and female			X	X			
Average number of hands employed: Males above 16 years; females above 15 years; children and youth					X	X	
Clerks or salesmen: Males above 16 years; females above 15 years; children; average number employed during the year; total amount paid in wages during the year							X
Greatest number of hands employed at any one time during the year						X	
Number of men employed		X					
Number of persons employed: Men, women, boys, and girls	X						
Officers and firm members: Males; females; average number employed during the year; total amount paid in wages during the year							X
Operatives, engineers and other skilled workmen, overseers and foremen, or superintendents (not general superintendents or managers); Males above 16 years; females above 15 years; children; average number employed during the year; total amount paid in wages during the year							X
Piecework (not included in the foregoing statement): [2] Males above 16 years; females above 15 years; children							X
Total amount paid in wages during the year					X	X	
Watchmen, laborers, teamsters, and other unskilled workmen: Males above 16 years; females above 15 years; children; average number employed during the year; total amount paid in wages during the year							X
Weekly rates of wages paid and average number of hands employed at each rate (not including those employed on piecework) [from under $5 by gradations to $25 and over]: Males above 16 years; females above 15 years; children							X

[1] Census, Manufactures, 1905, Pt. I, p. lxxxiii. Special reports of the Census Bureau.
[2] The "foregoing statement" included operatives, engineers, and other skilled workmen, overseers and foremen, or superintendents (not general superintendents or managers); watchmen, laborers, teamsters, and other unskilled workmen.

between all of the different census years within the period. Throughout the 27-year period since the census of 1899, the wage item has been reported in exactly the same way, namely, as the total amount paid in wages.[8]

The number of employees has been reported, during the period 1899–1925, in a form which, although superficially not quite as uni-

[8] Since 1904, however, it has not been reported separately for different sex and age groups.

form as in the case of the wage-payment items, is substantially on a uniform footing for the whole period. The only important difference is that in the first two censuses of the quarter century under review, namely, those of 1899 and 1904, the average number of wage earners was based upon reports from the different establishments in response to a request for "the average number of wage earners, including pieceworkers, employed during each month," whereas in 1909 and each following manufactures census year, the numbers reported each month were not the average number employed during the month, but the actual "number as per pay rolls or time records on the 15th day of each month * * * " As is indicated in another place, it is not believed that this difference materially affects the resulting annual average numbers of wage earners. Under the method of return used in 1899 and 1904, and under the style followed in 1909 and following census years as well, the monthly returns have been treated in the same uniform fashion, namely, the monthly numbers added together and divided by 12, and the resulting quotient published in the census returns under the heading "Wage earners (average number)." [9]

During the period covered by this analysis, there have been two special inquiries relating to employees and wages. The first of these two reports, known as "The Dewey Report," published in 1903, made a wage comparison between censuses of 1889 and 1899.[10] The second report utilized the inquiry made in connection with the first quinquennial census of manufactures in 1905 and was published in 1908.[11]

THE DEWEY REPORT

The Dewey report is based on an investigation distinctly selective in its character. Returns were secured from 33 of the more important manufacturing industries, and within these 33 industries only a small proportion of the establishments were reported. The industries and establishments which were covered, however, were reported in an extraordinarily careful and detailed fashion. The statistics are primarily of weekly rates of wages, weekly earnings being shown in only a few special cases. The data are quite minutely classified by occupations and are presented in the form of frequency distributions, in which the weekly rates are shown in 50-cent classes. Cumulative percentages are thrown alongside the frequency distributions. Parallel arrays of both absolute and cumulative percentages are given for 1890 and 1900. Not only are the statistics presented in a form

[9] Copies of the inquiries pertaining to wage earners and wages in each census year from 1899 to 1925, inclusive, are printed in the Appendix.

[10] Employees and Wages, by Davis R. Dewey, expert special agent. Special reports of the Twelfth Census. U. S. Census Bureau, 1903.

[11] Earnings of Wage Earners, Census of Manufactures, 1905, Bull. 93, U. S. Census Bureau. The data refer to the year 1904.

highly classified according to occupations, within each of the 33 industries shown, but they are also quite well subdivided in respect to geographic location, although regional classification is not carried as far as occupational.

The frequency distributions and cumulative percentage arrays for the different occupational groups make up the bulk of the large volume containing the Dewey report. These large tables, however, are condensed into summary form by utilizing the cumulative percentages to locate the median and quartile groups of wages and these median and quartile groups, for rates of wages per week, earnings per week, or rates per hour, are made up into summary tables showing each of the different industries classified by occupations.

It is significant that Mr. Dewey did not see fit to make any consolidation of his results for the different industries. Not only did he feel, apparently, that he was not warranted in consolidating the 33 industries to show a final frequency distribution for all industries combined and for the United States as a whole, but he did not even consolidate all occupations, sex and age groups, within the different industries. His nearest approach to consolidation is his grouping of all occupations of a given sex or age group in a given industry; that is to say, he shows, for example, all males 16 years and over in the agricultural-implement industry in all regions, and presents the frequency distribution of those male wage earners and cumulative percentages corresponding to that distribution.

On the whole, the Dewey report was probably the most important and most reliable report on wages which had, up to that time, been published in the United States. Although it relied upon samples, those samples were in most cases sufficiently large. The industries were carefully selected to cover every important kind of manufacturing and to include also a sufficiently large number of wage earners to make the returns representative. Another outstanding merit of the report is that the data are presented in practically their original form. A serious defect of the Dewey report is that, as a result of the frequency distribution method, the report assumes a quite voluminous and unwieldy form. A second and more important defect is one which is somewhat related to the first, namely, that it nowhere presents any final or summary results of the investigation as a whole. The wage earners in each industry are assigned to their particular occupational group, these groups assembled by geographic regions, and finally a total is presented for each sex and age group for the entire industry, but as already remarked, there is no consolidation of the industries to show what was the general drift of wages during the decade covered, or to give any idea, even the roughest, of the average rate of wages.

Since the Dewey report was published, however, two useful summaries of it have appeared. The first one was made by Henry L. Moore, and the second by A. E. James.[12] Both of these writers have based their discussions very largely, if not entirely, upon their own consolidation of the industries reported by Mr. Dewey, with the object in each case of showing in a final summary the distribution of wage earners and wage groups in all the industries for the whole country. The two summary tables presented by Messrs. Moore and James are practically identical, except that Mr. James presents not only columns of absolute percentages, but also the cumulative percentages, which are not introduced by Mr. Moore.

The use which has been made of the Dewey report in this present analysis is only a minor and incidental one, because so far as the main part of this monograph is concerned, it has been necessary to work in the somewhat foggy atmosphere of census averages. The material of the Dewey report has not been at all pertinent except in Chapters X and XI, which present the results of a special treatment of the original establishment schedules, with the idea of attempting to show something about the degree of variation in wages.

In connection with the study of variability, then, certain parts of the Dewey report have been utilized; since even in this subsidiary section of our monograph we are still dealing with earnings, not rates, only such industries as reported wages in the form of earnings, for the Dewey report, are utilized. In Chapter XI an effort was made to compare, on the basis of constant purchasing power, the distribution of earnings shown for 1890 and 1899 in the Dewey report, with a similar distribution of earnings worked out for the census year 1919 by transcribing selected establishment records for that year.[13]

CENSUS BULLETIN 93

In the first quinquennial census of manufactures in 1905, the schedules used were practically the same as those used in 1900, but, in addition, a statement was asked for from each establishment giving the number of persons employed at various classified earnings for the week of maximum employment during that census year—1904. The answers to this special inquiry were in many cases imperfect, and for this reason the results were not included in the published general tables covering all establishments, but a separate bulletin was published covering 123,703 establishments, which

[12] Moore, H. L. "The variability of wages," 22 Political Science Quarterly, 61–73 (March, 1907).
James, A. E. "The Dewey report on wages in manufacturing industries in the United States," in the Publications of the American Statistical Association, September, 1907, pp. 319–344.

[13] Similar comparison is made between the 1919 frequency distribution of earnings and the 1904 distribution in Census Bull. 93.

constituted 62.9 per cent of the whole number of establishments reported in the 1904 census.[14]

This report is much smaller in volume and much larger in scope; that is to say, much more of a *census* of earnings, than was the Dewey report. It presents the results in the form of frequency tables of weekly earnings for not less than 333 industries, and similar frequency tables are given in somewhat greater detail for 25 selected industries, and in still further detail for 5 selected industries. The report also presents average weekly earnings computed from the frequency tables. Summary tables are presented showing the median groups of earnings and alongside the median are the corresponding average weekly earnings. Census Bulletin 93 reports average weekly earnings, classified frequency distribution of earnings, and median groups of earnings not only by elaborate industry divisions, but also by geographic divisions and States.

It is this comprehensive and systematic subdivision of data geographically and industrially, together with the fact that average weekly earnings are presented for different sex and age groups in the different industries and regions, and the fact that it dealt with weekly earnings rather than weekly rates, that have made Census Bulletin 93 seem to be the most satisfactory census report on wages for the purposes of this present analysis. Accordingly, systematic use has been made of it in the preparation of the estimates herein presented of the amounts of annual earnings. In so far as the present analysis deals with changes in average earnings, rather than the absolute amounts of those averages, it has made no use whatever of Census Bulletin 93. In other words, the only section of this monograph which rests in any degree upon the returns published in Census Bulletin 93 is Part II, which deals with estimated amounts of per capita annual earnings. In that section of the monograph, Census Bulletin 93 is used as the point of departure for arriving at estimates of the amounts of annual earnings in the year 1904, and by application of estimated degrees of change in the census averages from one year to another, the corresponding amounts for earlier and later periods have been worked out. It is true, that in so far as the amounts of average weekly earnings showing in Census Bulletin 93 are in error, to just that same degree, at least, the estimated amounts shown in this monograph must also be in error. It would indeed be fortunate if it could be believed that the value of the present estimates of amounts of earnings rested entirely upon the results shown in Census Bulletin 93. Unfortunately there are other items entering into the present calculations of amounts of earnings which are probably less safe than the average weekly earnings data of 1904.[15]

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[14] Bull. 93. U. S. Census, Manufactures, 1905 (1904), Earnings of Wage Earners (179 pp.).

[15] The following summary table from Census Bull. 93 (p. 11), indicates th
are presented.

UNITED STATES—SUMMARY OF ALL WAGE EARNERS, BY CLASSIFIED WEEKLY EARNINGS, WITH PERCENTAGES AT EACH AMOUNT: 1905

WEEKLY EARNINGS	Number of wage earners	Per centage in the group	Cumulative per centage	WEEKLY EARNINGS	Number of wage earners	Per centage in the group	Cumulative per centage
Total	3,297,819	100.0		$8–$9	255,458	7.7	63.2
				$9–$10	378,009	11.5	55.5
Less than $3	132,064	4.0	100.0	$10–$12	439,208	13.3	44.0
$3–$4	150,403	4.6	96.0	$12–$15	464,875	14.1	30.7
$4–$5	194,301	5.9	91.4	$15–$20	390,867	11.8	16.6
$5–$6	206,163	6.2	85.5	$20–$25	106,700	3.2	4.8
$6–$7	262,531	8.0	79.3	$25 and over	51,728	1.6	1.6
$7–$8	266,012	8.1	71.3				

Total earnings for the specified week, $33,185,791; average per wage earner, $10.06.

CENSUS METHOD OF COLLECTING AND TABULATING RETURNS

Since the creation of the permanent Census Bureau, censuses of manufactures have been taken in five-year intervals only since 1900.[16] The report in each case covers the operations of the preceding calendar year, so that in this monograph the census years covered are 1899, 1904, 1909, 1914, 1919, 1921, 1923, and, in a preliminary form, 1925. Section 32 of the "The act to provide for the fourteenth and subsequent decennial censuses," approved March 13, 1919, provided that thereafter statistics of the products of manufacturing industries should be secured in each even year relating to products manufactured during the odd year; that is, 1919, 1921, and 1923, etc. We have, consequently, 3 biennial census years included in the period under review, the years 1921, 1923, and 1925, which with the year 1919, give us 3 intervals of 2 years following upon the 4 intervals of 5 years each, which latter make up the bulk of the 27-year period. The manufactures census covers some 356 industrial groups of which 41 of the most important (comprehending 68 per cent of all manufacturing wage earners in 1919) are included in the present study.

The schedules in the manufactures census are filled out either by field agents of the Census Bureau or by the firm, subject to the supervision of the enumerator. In so far as consistent with correct returns, the Census Bureau has endeavored to obtain reports by mail directly from the establishments; in any case, however, the figures are certified to by the owner or responsible official of the establishment to which the schedule relates. When completed the schedules are returned to the Bureau of the Census at Washington, where they are edited by the division of manufactures. Whenever an entry appears to be in doubt, it is verified by communication with the establishment from which the schedule was received. The material is then tabulated by States, industries, sex and age groups, etc., and, after verification, published.

[16] From 1919 these censuses have been biennial.

THE ALDRICH REPORT

Before discussing the wage statistics of other governmental agencies, mention should perhaps be made of the Aldrich report on wages. In connection with the preparation of the report of the Senate Committee on Finance on wholesale prices, wages, and transportation, Mr. R. P. Faulkner, acting as statistician for the committee, prepared the tables of wages which appeared therein and in the construction of them use was made for the first time in connection with wage statistics of the device of index numbers.[17] The use of relatives, or index numbers, to show the rise or fall in wages over periods of time, constitutes one of the very few great improvements that have been made in methods of dealing with wage statistics. Another, and perhaps the only other, being the use of classified (frequency) wage tables. In the Aldrich report daily rates of wages for each year from 1840 to 1891 were obtained from actual pay rolls in 22 industries, of which 21 were shown in the final tables. The number of distinct series of quotations, or wage rates, from 1860 to 1891 was 543, many of these covering the same occupation in different establishments of the same industry. The daily wages paid in January, 1860, were taken as the base or standard of each wage series presented and an index number calculated for each year backward to 1840 and forward to 1891. The daily wage rate for each occupation was obtained by averaging the reported daily wage rate for each different employee in that occupation. From the rates for occupations arrived at in this fashion, index numbers, or relatives, were calculated with the year 1860 as base.

THE UNITED STATES BUREAU OF LABOR STATISTICS

The United States Bureau of Labor Statistics is the only important agency of the Federal Government, besides the Census Bureau, which has produced any considerable body of wage statistics for manufacturing industries. Its first series of wage statistics followed, in a general way, the method of Mr. Faulkner in the Aldrich report. The bureau, however, improved upon the Faulkner model and very considerably increased the scope of the data. The information collected and published by the Bureau of Labor Statistics concerning wages and hours of labor are divided into two general classes: Union scales of wages and hours of labor, for which the data are obtained from labor union officials; and statistics of wages (in the form of rates or earnings) and hours, for which the data are obtained from pay roll records, through employers and without regard to whether the employee is a union member or not. We are primarily concerned with the statistics of the latter type. They have been collected more or

[17] Wholesale Prices, Wages, and Transportation, Senate Report No. 1394, by Mr. Aldrich, Senate Committee on Finance, Mar. 3, 1893.

less continuously since 1890, with the exception that for certain industries data are not collected as often as once a year, but biennially or, in a few cases, even less often.

From the data secured from pay rolls the following items of wage statistics are developed: Average hourly wage rates; average scheduled (or full-time) hours of labor per week, or other pay-roll period; average hours actually worked per pay-roll period; average full-time earnings of employees per pay-roll period; and average actual earnings of employees per week or other pay-roll period. The averages given in the published reports are for representative weekly, monthly, or other pay-roll periods during the year, and comparable averages are given, when available, for corresponding periods in previous years. Index numbers are utilized for making these time comparisons.[18] In making the present analysis, however, we are less concerned with the Bureau of Labor Statistics' figures on wages and hours of labor than we are with a certain statistical by-product of its series of figures on the volume of employment which has been reported monthly since the year 1915.

In connection with this inquiry into the volume of employment, the bureaus published monthly the total number of employees and total amount of pay rolls in a large number of establishments in manufacturing industries of the United States. Recently this work has been greatly enlarged, until it now covers 4,000 establishments in 54 selected industries, employing over 3,000,000 persons. The industries included coincide very closely with the 41 selected industries used in this monograph. Data are secured for the pay-roll period ending nearest the 15th of each month. In its periodic reports published monthly in the Labor Review, the bureau now shows a "comparison of per capita earnings" in each month with per capita earnings in the preceding month for each of the 54 industries. These comparisons are put in the form of month-to-month percentages of change, up or down, as the case may be, and arrived at by first dividing the amount of pay roll (which is the amount paid in wages) by the number of employees on the pay roll for that pay period and ascertaining the ratio of increase or decrease between the quotient so obtained and quotient which had already been obtained, in similar fashion, for the preceding month. The quotients themselves, that is to say, the amounts of per capita earnings, as they might be called, are not published by the bureau. As has already been intimated, there would seem to be quite as much justification for the publication of such figures as representing average earnings as there is for the States of Massachusetts and New York to publish such quotients as "average earnings," and as there is for the

[18] See U. S. Bureau of Labor Statistics Bull. 326, "Methods of procuring and computing statistical information of the U. S. Bureau of Labor Statistics."

Census Bureau to divide the annual amount paid in wages by its average number of employees and to call the result "average earnings." At all events, the month-to-month percentages of change in per capita earnings, issued by the Bureau of Labor Statistics, has been utilized, as explained in Chapter XIX, to interpolate for the intercensal years amounts corresponding to the average wage item of the census year, derived directly from the census records.

In connection with the process of converting money earnings into real (or commodity) earnings, large use is made in this monograph of the retail price cost of living indices published by the United States Bureau of Labor Statistics.

STATE BUREAUS OF LABOR STATISTICS

Brief mention should perhaps be made of the small handful of States which, through their bureaus of labor statistics, publish statistics of per capita earnings, or issue their wage statistics in such form as to make it easily possible to derive per capita earnings from their published figures. The States which deserve special mention, for this reason, are New York, Massachusetts, Illinois, and Wisconsin. It should be made clear that, in the interpolation of the intercensal years for the analysis contained herein, the Bureau of Labor Statistics per capita earnings ratios were not relied upon alone, but were consolidated with similar per capita earnings figures from the States of New York, Massachusetts, Illinois, and Wisconsin. The interpolation of intercensal years for those 12 of our 41 industries which the United States Bureau of Labor Statistics has been covering since 1915 has been made for the period from 1914 to 1925 by use of the Bureau of Labor Statistics' data alone, on account of the fact that the industrial classification used by the different States mentioned was not sufficiently uniform to admit of consolidation along industrial lines. For the period 1899 to 1914, State materials alone have been relied upon. In addition to the States already mentioned, the volume of employment figures of New Jersey were utilized in a supplementary way in the computation of an index of employment by the least squares method. The New Jersey Series of employment figures has now been discontinued.

NONGOVERNMENTAL AGENCIES

Only one nongovernmental source of statistical material has been relied upon to any considerable extent in this monograph. That agency is the National Bureau of Economic Research. The report published by that bureau on Employment, Hours, and Earnings in Prosperity and Depression, has seemed to furnish the most reliable

material for constructing a bench mark from which to measure the actual amount of unemployment at different points along the employment curve. Even this report is semiofficial inasmuch as it embodies "the results of an inquiry conducted by the National Bureau of Economic Research, with the help of the Bureau of Markets and Crop Estimates and the Bureau of the Census for the President's Conference on Unemployment." [19] The National Bureau's results have also been utilized in one or two other ways, as will appear in the context where its work is referred to. Its classification of the country into 3 geographic regions and into 6 industrial divisions, has also been combined with the census classification into 14 industrial groups and 9 geographic divisions.

One table published by the National Industrial Conference Board has been included to throw some light upon the degree of parallelism in the changes which take place in earnings as between male and female and skilled and semiskilled workers.

[19] W. I. King, Employment, Hours, and Earnings in Prosperity and Depression, United States, 1920-1922. New York National Bureau of Economic Research, 1923.

Chapter XIII

THE CENSUS AVERAGE WAGE

In entering upon the discussion that occupies this chapter, it can not be too sharply emphasized that the expression "census average wage" does not refer to any statistical term actually published by the Bureau of the Census; it is used throughout this monograph to identify the quotient obtained by dividing the amount paid in wages by the average number of wage earners, both these latter terms being regularly published by the Census Bureau.

FORM OF ORIGINAL INQUIRY

The information regarding employees and wages asked for on the original schedules sent out by the manufactures division of the Census Office has been practically uniform throughout the period covered by this analysis. In each manufactures census year the schedule has asked employers to report under Item 5: "Wage earners, including pieceworkers; number as per pay rolls or time records on 15th day of each month of period covered by this report, if data are available for that day. If data are not available for the 15th of the month they are to be reported for the nearest representative day." This is the wording which appears in the 1919 and 1914 census schedules. This item takes practically the same form also in the censuses of 1899, 1904, and 1909. In the manufactures census schedule of 1921 the item reads "Wage earners, including pieceworkers employed on the 15th day of each month, or nearest representative day, in the establishment here reported * * *." The wording for the 1923 and 1925 census schedules is practically the same.

The second and only other important item with which we have to deal in this book is No. 6, which asks for the total amount paid in salaries and wages during the year covered by the report. The subdivision of this item with which we are especially concerned is the one reading "wage earners, including pieceworkers." Again the quotation is from the general schedule of the census of manufactures for 1919. The wording on the 1914 schedule is identical and on all earlier schedules for the period in which we are interested the language is almost exactly the same. On the 1921 and 1923 schedules the corresponding item is No. 3, marked "salaries or wage payments," and the subdivision of this item in which we are interested in subdivision "b"—"total amount of wages for period covered by this report."

The only other schedule items with which we are at all concerned (and we are interested in them only in a very incidental way) are Inquiries 3 and 7, which ask, respectively, for the number of salaried employees of each sex, including a separate report for "clerks, stenographers, salesmen, etc.," on the pay roll on December 15, or nearest representative day, of the manufactures census year, and for the time the establishment was in operation in days per year and the number of hours normally worked by wage earners per shift and per week. Of the two schedule inquiries with which we are here chiefly concerned, the wage-payment inquiry and the one concerning the number of wage earners, the former only can be answered by entry of a single amount. The other inquiry, regarding the number of wage earners, asks for 12 separate items, giving the number as per pay roll on the 15th day of each month of the census year. These figures are reported in the original monthly form in certain parts of the published reports of the census of manufactures, but we are not concerned with them in that form. Since the amount paid in wages is not reported monthly but only for the year as a whole, it becomes necessary to convert the monthly number of wage earners into some sort of yearly average. The census computes this average in the following fashion:

The number of employees, both male and female combined, on the pay rolls for each month are added together and the aggregate of these items is divided by 12. This procedure is followed whether or not the establishment operated throughout the year. If the establishment operated only six months of the year, the established procedure has involved the summation of the numbers of employees on the pay rolls in each of the six months during which the plant was in operation and the division of that aggregate by 12. The effect of this particular method of arriving at an annual average number of wage earners is discussed in another place in some detail. (See p. 277 et seq.) It suffices here to call attention to the fact that an average so calculated would on the face of it seem to represent an average number of full-year workers and produce, therefore, when divided into the total amount paid in wages, an average amount of full-time earnings. In the report of the Census Bureau this mean number, so derived, is called the "average number of wage earners."

In undertaking, then, to find out from census material something about the per capita amounts of earnings received by wage earners, or something about the changes which have taken place in those amounts, there are at hand for different geographic jurisdictions and different industries, the two items reported by the census as "wage earners, average number" and "wages" (i. e., the amount paid in wages). Practically nothing else is available. Certain other items, such as the number of days in operation during the year and to a less extent

the monthly fluctuation in the numbers of wage earners employed, may be brought in, in an auxilliary way, to help with the adjustment and interpretation of the results obtained by use of the two main items referred to. Fortunately, in making the present analysis the writer has not been confined to the census material. This material has constituted the foundation and point of departure, but auxilliary use has been made of other official statistics published by the Government and, to a slight extent, also, of unofficial data issued from authoritative private agencies.

THE CENSUS AVERAGE WAGE[1]

It would seem that the first and most obvious thing to be done with the two items (wages and wage earners) is to divide one by the other.

The quotient obtained by dividing the amount paid in wages by the census average number of employees (referred to hereafter as the "census average wage") would at first blush seem to represent a legitimate average wage or average amount of earnings. Further examination, however, reveals the fact that largely because of the peculiar way in which the average number of employees is computed, this quotient is by no means all that it appears to be. It is, of course, to be expected that such an average would have the usual shortcomings of an average; and it does have them. What is worse, it has the additional defect that it not only does what all averages do, conceal variations which may be extremely wide, but it also fails to indicate what even as a mere average it would naturally be expected to indicate: It does not measure the amounts of earnings with even an approximate accuracy. It will be seen that it does measure, with what is believed to be a very close approximation to accuracy, the changes in full-time earnings as distinguished from actual earnings, and this feature is utilized to the fullest extent in applying the average wage figures to the purposes of this inquiry.

In the census years 1880, 1890, and 1900 the Bureau of the Census did divide the amount paid in wages by the average number of employees and the results of these divisions for these census years, classified by States and Territories and by industries, are published in the printed report of the Twelfth Census.[2] The division was also made in the manufactures census of 1904. Since 1904 there has been no attempt made to divide amounts paid in wages by the number of wage earners, and there have been no figures published that purport to show annual earnings.

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[1] See initial paragraph of this chapter, p. 262.

[2] Twelfth Census, Manufactures, Pt. I, pp. cxv to cxxii. They are published in connection with a "Summary and Analysis of Results" and are accompanied by a rather emphatic textual criticism, chiefly directed against such so-called average earnings.

The difficulty, as already indicated, results largely from the method of computing the average number of employees. The Census Bureau in 1900 was perfectly aware of the anomalous character of this average. In the analysis of the results in the report of the Twelfth Census, referred to above, there occurs the following comment upon this average:

> On account of the varying numbers of employees in a manufacturing establishment during a given year, due to change of employment and to seasonal trade conditions, it is becoming more and more difficult to establish a statistical term which will accurately represent the number of wage earners to be used as a divisor into the total amount of wages paid in order to derive a quotient to serve as a wage average. The average number of persons stated in the schedule as employed by months during the census year is a variable and, to some extent, an arbitrary figure, not properly comparable with the total amount paid in wages during the same periods, which amount is a fixed sum paid, not to the average number of persons employed, but to all persons employed, many of them for a few weeks or days only.

The tables of the Twelfth Census showing "average annual earnings" indicate, for all sex and age groups for all industries and for all geographic regions combined, that the average annual earnings in 1880 were $346.91 and the corresponding earnings for 1890 were $444.83. The report of the Eleventh Census in commenting upon these two figures, says that "owing to the differences in form and scope of the inquiry in 1890, as compared with that of 1880, previously referred to, neither of these average annual earnings (amounts) for 1890 should be accepted as the exact increase during the decade."[3] In the discussion of these figures in the analysis of results in the Report on Manufactures of the Twelfth Census, it is stated that "those who are familiar with the conditions of industry at the two periods above referred to (1880 and 1890) are quite aware that neither the stated increase of average earnings, amounting to about 28 per cent, nor any increase approximating thereto occurred." The report of the Twelfth Census states finally that "for the purpose of any such comparison the figures were worthless, owing to the general conditions under which such figures must always be obtained for a census, the radically different phraseology of the two schedules and the different methods of computing the results."[4]

Then, after presenting comparative figures for average annual earnings in 1880, 1890, and 1900, the Twelfth Census report (1900) concludes that "considerations of this character justified the Census Bureau in affirming with all possible emphasis that the attempt to obtain the average earnings from the census figures, or to establish an average wage in the several census periods through the use of these statistics, is a false use of them and is not justified under any

[3] Eleventh Census, Manufactures, Pt. I, p. 19.
[4] Twelfth Census, Manufactures, Pt. I, p. cxiii.

circumstances."[5] The official strictures above quoted made by the Census Bureau upon its own data and upon the process of dividing wage payment by average wage earners, were, in the opinion of the present writer, fully justified at the time. Similar strictures, however, can be applied with less force to the period since 1900.

The problem of computation of average annual earnings received some further discussion and criticism, in the report of the 1904 census of manufactures, the latter being in this case somewhat more favorable.[6] Special emphasis was laid upon a defect in the quotient of wages divided by workers which is necessarily inherent in any average, especially when the items averaged are statistical conglomerates. The census of 1904 reports wages paid and the number of wage earners by industries, without making the division of one by the other.

The census makes no distinction, in the matter of wages paid, between male, female, and juvenile employees, and in none of its published figures does it make any separation of the different kinds of labor, marking off highly skilled from semiskilled and unskilled. There is no distinction made between the different qualities of labor which are reflected in different occupations. In the language used in the discussion of the subject in the 1905 census of manufactures—"it must never be assumed that the result (of dividing wages by wage earners) shows the average annual earnings of a machinist or of a weaver, or of a laborer, or of a wage earner in any other occupation; or that it is the earnings of the average person working a whole year, or those of a group employed six months, or a month, or any other period of time."[7] In the same place the official commentator goes on to say that the census average wage is simply * * * the annual earnings in each case of a complex average unit or artificial person." He continues: "This average unit is the average of wage earners of heterogeneous occupations and rates of pay, working for varying lengths of time, in each industry, each State, and the United States, respectively. But it gives a quantitative statement of average annual earnings, which is the only statement easily grasped; presents a general idea regarding wage earners as a whole; and furnishes results by which, character of elements and methods of computation being clearly stated and understood, complex conditions can be interpreted."[8] This discussion in the report of the 1905 census concludes that, with this distinct appreciation of the limitations within which this average is to be used and interpreted, it "has a practical value." The important requisites, it is pointed out in the same place, are "that from census to census, methods should remain

[5] Twelfth Census, Manufactures, Pt. I, p. cxvii.
[6] Special reports of the census of manufactures, Pt. I, pp. lxxxix to xcviii.
[7] Census, Manufactures, 1905, Pt. I, p. lxxxix.
[8] Report, Manufactures, 1905, loc. cit., p. xc.

the same and that the average number be obtained with all accuracy." Admission finally is made that efforts to attain these conditions had not at any time proved wholly successful.

In the report of the Thirteenth Census (1910), after stating that no attempt had been made to calculate an average wage, and that "such a broad average would have very little significance," the following comment was made:

* * * such a calculated average would not in any case show the average annual earnings of wage earners, since the average number of wage earners from which it would have to be calculated does not represent *the actual number* of different persons engaged in manufacturing industries, but represents the number who would be required to perform the work accomplished if all were continuously employed.[9]

In the report of the Fourteenth Census (1920) the following statement is made:

The Census Bureau has not undertaken to calculate the average earnings of either salaried employees or wage earners. Such averages would possess little real value, because they would be based on the earnings of employees of both sexes, of all ages and of widely varying degrees of skill. Furthermore, so far as wage earners are concerned, it would be impossible to calculate accurately even so simple an average as this, since the number of wage earners fluctuates from month to month, in every industry, in some cases to a very great extent. The Census Bureau's figures for wage earners * * * are averages based on the number employed on the 15th of each month, and while representing the number to whom, according to the pay rolls, wages were paid on that date, no doubt represent *a larger* number in any industry than would be required to perform the work if all were continuously employed during the year.[10]

The statement in the Thirteenth Census does not seem to have made sufficient allowance for the pay-roll padding which results from labor turnover;[11] the Fourteenth Census statement is more accurate. The census figure for wage earners is unquestionably too large accurately to stand for the equivalent number of full-time workers. When divided into the amount paid in wages, therefore, it gives an average-earnings figure which is too small accurately to reflect *full-time* earnings. Moreover, as is explained elsewhere, it usually is either too large or too small to reflect actual earnings.

It seems to the present writer that in some respects the interpretation given the census average wage[1] in the discussion of it in the 1905 report is distinctly favorable; it also seems to him that the earlier discussion in the report of the Twelfth Census was in some respects unduly cautious. The writer does not believe that the census aver-

[1] See initial paragraph of this chapter, p. 269.

[9] Thirteenth Census. Vol. VIII. Manufactures, p. 28.

[10] Fourteenth Census. Vol. VIII. Manufactures, p. 10. Essentially the same statement as is contained in the last sentence of this excerpt is made in the reports of the manufactures censuses of 1921 and 1923. (Biennial Census of Manufactures, 1921, p. 8; Biennial Census of Manufactures, 1923, p. 7.)

[11] In the Biennial Census of Manufactures, 1923, there is explicit recognition of the effect of labor turnover upon the census statistics of wage earners: "The pay rolls in many cases contained the names of part-time employees, of employees who have been laid off temporarily, or of persons whose services had terminated a few days prior to the pay-roll date" (p. 6).

age wage, as it now can be figured on the basis of original data available since 1899, can be characterized by the language used in his report on wages for the Tenth Census by Mr. Joseph D. Weeks in reference to the census average wage of that earlier period. He declared that it really "represents nothing but the result of the division of one number by another." [12] The present writer does not believe that the official criticism, above cited, of the census average wage, on the basis on which it then had to be worked out, has nearly so much force in reference to the period since 1899.

The chief reason for the criticisms in the earlier period was the lack of uniformity in the form in which the original information was returned. But since 1899, uniformity has been established and the two items which are to be divided, one by the other, have been reported in essentially identical form.

DEFECTS OF THE CENSUS AVERAGE[1]

In other respects, however, we are forced to conclude that certain of the defects pointed out above remain inherent in the average wage payment item up to the present time. Among these is the fact that no adequate separation is made in the amount paid in wages so as to make possible the allocation of parts of it to different kinds of labor, such as skilled labor, unskilled labor, etc. The other factor in the census average—that is, the number of wage earners—is (somewhat less seriously) deficient in the same way. It is classified by sex and age groups, but not by occupation or by any other criterion that might separate different kinds of labor. The necessary result of this weakness in both terms which enter into the average wage is to make it an average of somewhat doubtful character. It is not surprising that since 1899 the Census Bureau has refrained from publishing it.

The character of the two factors entering into the average wage payment makes it something similar to what we would have if we reported in our price statistics the single average price for any given year of butter, eggs, and cheese. We have in the census average almost as much of a "catch-all" mean, when we report that the average earnings during a given year of the laborers, semiskilled operatives, and highly skilled mechanics in a textile mill, for example, is a certain sum. This defect is with us yet and any interpretation of the resulting figures must reckon with it. Further, it seems evident that we must confirm the earlier strictures upon the value of the census average wage, in so far as those strictures question the value of the average as showing the amounts of earnings at the different periods. The present writer does not believe that even

[1] See initial paragraph of this chapter, p. 269.

[12] Report of the Tenth Census. Vol. II, p. 6.

now, with uniform census methods for securing the original information, this census average wage correctly shows amounts of earnings—either full-time or actual. What it does seem correctly to measure, and what it appears to have measured very faithfully during the last quarter century, is the degree of change in full-time earnings. The use made of it in this monograph, therefore, is that of an indicator of such ratios of change. Other expedients, which in themselves are not too satisfactory, but which are believed to be superior to the method of reliance on the census average, are utilized for the purposes of estimating the amounts of earnings at different periods.

It has been stated that, from and including the census of 1899, the two items which are really important, namely, the amount paid in wages and the average number of wage earners, have been collected in the field in a form which has been virtually uniform throughout the period. To this statement one qualification should be made. In the two manufactures census years 1899 and 1904, the establishment schedule asked employers to return "average number of wage earners, including pieceworkers, employed during each month," instead of requesting, as has been the case since then, the number of wage earners shown by the pay rolls to have been employed on the 15th of each month. It may be noted also that in these first two census years of the period covered in this monograph, the average number of wage earners employed during each month was shown separately for men and women 16 years of age and over, and for children under 16 years. For the census years from 1909 to 1919 the numbers of wage earners on the 15th of the month were shown only under the two headings, male and female, and since 1919 no sex distribution has been made. It is very unlikely that this change in the method of reporting the number of employees each month makes any appreciable difference in the census average wage calculated from monthly figures derived by the two different methods. It seems quite possible, as Mr. M. O. Lorenz has pointed out,[13] that the method adopted in the 1909 census and followed thereafter would lead to somewhat greater care on the part of the employer in filling out this part of the schedule. Employers are now asked for a specific number on a specific day and doubtless are more likely to report the information from actual records. When the average number during the month is called for there is possibly some temptation to make rough estimates, and these "guesses" are likely to be too large rather than too small. It is not believed that this difference materially affects the comparability of the two earlier census periods with the later ones. Throughout the whole 27-year period there has been, nevertheless, a constant tendency to produce a larger

[13] Typewritten manuscript in the files of the Census Bureau on "Numbers of persons employed," dated June, 1919, p. 9.

average number of wage earners than the facts warrant, and thus to produce, in turn, when that number is divided into the amount paid in wages, a census average wage which, while inaccurate as an absolute sum, is (fortunately for our purposes) in error by a margin which throughout our period is probably quite uniform.

AVERAGE NUMBER OF WAGE EARNERS

The true character of the census average wage[1] will perhaps best be comprehended by the use of one or two illustrations based upon hypothetical establishment situations. First of all, it may be well to examine somewhat more carefully the census average number of wage earners, which enters so largely into the calculation of the census average.

Imagine two establishments, A and B, the first of which operates for six months during the census year and the latter for the full year. Assume that the earnings of the employees in each case are uniform for each of the months worked. Assume more specifically that in plant A, during each of the six months it was in operation, there were 10 men employed and each of the 10 men got a total of $50 in his pay envelope during each of the six months. In the other plant assume that the same number of men were employed during the whole year and that during this time their earnings were $50 per month per man. In the case of the plant in operation only one-half of the year, the average number of employees computed by the census method would be 10 multiplied by 6 divided by 12, or 5. In the case of the plant in operation the full year, the average number of wage earners would be 10 multiplied by 12 divided by 12, or 10. In the latter case an average of 10 employees per month is the number one would naturally say represented the size of the standard work force of the plant. In the case of the plant operating 6 months of the year, we would be inclined to say that the average number must also be 10. The Census Bureau calls it 5, and that figure obviously represents an average equivalent to the average which would be obtained by spreading the employment, which was actually concentrated into 6 months, over the whole year. That is to say, 10 men working 6 months, other things being equal, put in the same amount of labor time as 5 men working for a full year. The census average, therefore, in the case of both full and part time operation, represents, in so far as the number of actively employed wage earners reported is accurate, the average number of full-year workers.

Turning to the earnings of these 2 groups of 10 men in the 2 factories mentioned, it is evident that the total wage bill in Factory A will be $3,000 and in Factory B $6,000. In the case of these two

[1] See initial paragraph of this chapter, p. 269.

factories, the census average wage would be computed in the first instance by dividing $3,000 by the average number of wage earners, in this case 5, and in the second case by dividing $6,000 by the average number of wage earners, in this case 10. The quotient in each case is the same, $600, so that Factory A and Factory B, one of which was in operation twice as long as the other and gave each of its wage earners twice as much employment, at the same rate, as the other plant, appear in the census records as having made the same average wage payment, $600. This number, then, very distinctly does not represent the average actual earnings; it represents something which bears a definite relation, from one census period to another, to average full-time earnings. For reasons already discussed it can not be taken to represent the amount of full-time earnings, although it can be accepted as running from census year to census year at a uniformly definite point below the true amount of full-time earnings.[14]

A further illustration may be made in which the hypothetical plant is one in which the conditions are somewhat more representative of actual conditions than in the two plants just now discussed. Let us suppose that, on one of the original establishment schedules, the amount paid in wages during the year was reported as $157,248, and that the number of employees on the pay roll on the 15th of each month was as follows:

January	40	July	400
February	300	August	100
March	300	September	0
April	340	October	0
May	600	November	0
June	300	December	0

The census average number of wage earners, obtained by adding the above numbers to a total of 2,380 man-months[15] and dividing by 12, is 198.3.

It may be assumed that the total wage payment of $157,248, above mentioned, was distributed as follows:

$8,000 to 20 employees who worked 8 months at $600 a year.
$6,666 to 20 employees who worked 8 months at $500 a year.
$117,000 to 260 employees who worked 6 months at $900 a year.
$5,333 to 40 employees who worked 4 months at $400 a year.
$750 to 10 employees who worked 3 months at $300 a year.
$1,750 to 10 employees who worked 3 months at $700 a year.
$5,333 to 40 employees who worked 2 months at $800 a year.
$4,666 to 100 employees who worked 1 month at $560 a year.
$7,750 to 100 employees who worked 1 month at $930 a year.

[14] The writer is indebted for the form and much of the content of this illustration to Mr. M. O. Lorenz, who used it in the first instance in his manuscript on Census Wage Statistics, p. 7.

[15] This number represents man-months on the assumption that each employee at work on the 15th worked for the full month.

This statement of distribution of wage payments is intended to represent the actual time worked by each one of the employees in this hypothetical establishment and the rate of pay each received. It will be seen also that the sum of the products of the number of employees by the number of months worked will give the same number of man-months that is obtained by adding the number of employees at work on the 15th of each month; that is to say, 2,380 man-months. The census average wage in the case of this factory would be obtained by dividing $157,248 by 198.3, the resulting average being $794. Since none of the employees worked more than eight months, and most of them considerably less than that, it would seem that the actual earnings would be considerably below two-thirds of $794. The earnings actually received by each employee in this establishment, on the basis of the distribution assumed above, would be as follows:

20 employees who worked 8 months at $600 a year received $400 each.
20 employees who worked 8 months at $500 a year received $333 each.
260 employees who worked 6 months at $900 a year received $450 each.
40 employees who worked 4 months at $400 a year received $133 each.
10 employees who worked 3 months at $300 a year received $75 each.
10 employees who worked 3 months at $700 a year received $175 each.
40 employees who worked 2 months at $800 a year received $133 each.
100 employees who worked 1 month at $560 a year received $47 each.
100 employees who worked 1 month at $930 a year received $78 each.

The amounts in the last column represent the actual earnings of the 600 employees who were in the work force of this hypothetical factory for some period of time. The weighted average obtained by multiplying these amounts received in earnings by the number of employees receiving them and dividing the sum of the products by the total number of employees is $262. Now this true weighted average of actual earnings received by employees during their employment in this hypothetical factory seems to be, and is, a far cry from the average which would be obtained by dividing annual wage payments by the census average number of wage earners. Yet it would be a mistake to conclude from this that the census average wage is as far off from the true average of actual earnings received as this would seem to imply.

We have already seen that the census average wage[1] usually is either too high or too low to represent actual earnings and that the margin by which it exceeds actual earnings is sometimes quite wide, being wider, apparently, in periods of depression than in periods of prosperity, as is indicated in the figures in Table 20 and in other tables in preceding chapters. We do not believe that this margin of difference is likely to be as large as would appear from the hypothetical illustra-

[1] See initial paragraph of this chapter, p. 269.

tion just presented. The case taken undoubtedly represents an extreme situation; certainly the great bulk of the factories in the United States operate more than 8 months out of the 12. The census figures on time in operation indicate that the average time in operation for all establishments in all industries in the census year 1904 was 262 days, which is 86 per cent of a full year of 307 days. The typical factory, then, is in operation a much larger proportion of the year than the factory used in the above illustration. At the best, however, it is pretty clear that the census average does not accurately indicate amounts of earnings.

We must conclude, then, that there is only the remotest likelihood that the census average wage approximates at all closely the amounts of annual earnings actually received by the typical, or "average," wage earner. Indeed such fragmentary pieces of evidence as have come to hand indicate rather definitely that it does not represent such sums at all, even approximately.[16] No more does it reflect the amounts of theoretical full-time earnings of the average full-time worker, although it does appear to reflect the changes in those full-time earnings. The analysis, so far as it deals with estimated amounts of earnings, bases those estimates, as explained in the following chapter, on a foundation entirely different from the census average wage. However, as indicated above, this census average is used as a basis for determining *the degree of change* in full-time earnings per capita. The way in which it is used for this purpose is more fully explained below. Meanwhile, let us return to the statement just made, that the census average wage does not reflect the amounts of full-time earnings.

It fails to do this primarily because pay-roll figures do not represent the number of employees actually at work. Pay-roll numbers are always, or nearly always, larger than numbers representing the number of employees actually at work. This results from the practice of carrying names of wage earners on the pay roll after those persons have left. So it will not do to assume that every name on the pay roll on the 15th day of the month, say, represents the employment of one man for one month. In practice, some of the wage earners will be found to have been employed only a part of the time, and if these short-service wage earners have their respective fragments of time pieced together so as to indicate the number of full man-months of employment represented in any period, that number would be found to be smaller than the number of employees reported to the Census Bureau for that month. When this too-large item, then, is divided into the amount paid in wages, it results in a sum which is

[16] Compare Table 20 and fig. 4.

too low to represent full-time earnings.[17] How far the census average wage falls short of representing the amount of full-time earnings it is very difficult to say. Some conception of the margin may be had by an inspection of Table 20.

Not only does the census average wage fail to reflect at all accurately the amounts of full-time earnings per capita; it also, in the writer's opinion, fails, by more uneven, if not by wider, margins to measure actual earnings. This necessarily follows, in the first place, from the method by which the average number of wage earners is obtained; namely, by dividing the sum of the monthly numbers on pay rolls by 12. This division produces an average number which logically ought to represent (and which were it not for the padded pay-roll difficulty just mentioned would represent) fairly closely the average number of full-time wage earners. Therefore, when the average number of full-year wage earners is divided into the amount paid in wages, the result can not by any stretch of the imagination be conceived to represent actual earnings per capita. It perhaps would represent full-time earnings per capita if the monthly numbers on pay rolls really corresponded exactly with the numbers of wage earners at work, but we have just seen that this monthly number does not correspond with the actual number at work. If the manufactures census reported the number of equivalent full-month workers in each of the 12 months and then if that number were divided into the amount paid in wages during the year, the result, one would suspect, would be very close to per capita full-time earnings. But this is academic. Taking the statistical items actually published by the Census Bureau, the result of the division of the census average number of wage earners into the annual amount paid in wages is an "average wage" that represents neither amounts of full-time nor amounts or changes in actual earnings. This interpretation would seem to lead us to a confirmation instead of dissent from the remark quoted from Mr. Joseph B. Weeks, "that the average wage means nothing except the division of one number by another," and that is the logical conclusion from what we have just said, so far as amounts of wages are concerned. But actually in respect to the *degree of change* in earnings it does mean something besides a division of one number by another. This belief that there is warrant for the inference that the ratios between average wage figures for successive census years measure the degree of change in full-time earnings per capita rests upon the fact that although the census average is too low to represent the amount of full-time earnings, the margins by which it falls short of full-time earnings does not fluctuate greatly. This is, of course, due to the fact that the pay-roll inflation which makes it too low seems to produce a fairly uniform

[17] Cognizance is taken of this situation in the report of the Biennial Census of Manufactures for 1923. See citation therefrom on p. 6.

expansion in the "wage earners" factor and hence a fairly uniform reduction in the average wage. The result is that the degree of change between the successive smaller amounts is approximately the same as it would be between the larger and more accurate amounts of full-time earnings, which would be obtained if the numbers reported monthly were the numbers of equivalent man-months put in by the work force.

CORRESPONDENCE BETWEEN FLUCTUATIONS IN CENSUS AVERAGE WAGE[1] AND FULL-TIME EARNINGS

The figures in Table 128 tend to confirm what has been said. The figures in the first column are census average wage figures for each of the census years. Those in the second column are estimated full-time earnings per capita worked out as a result of the analysis

TABLE 128.—COMPARISON OF AMOUNTS OF CENSUS AVERAGE WAGES WITH DOLLAR AMOUNTS OF FULL-TIME EARNINGS AND ACTUAL EARNINGS, PER CAPITA, FOR CENSUS YEARS: 1899–1923

YEAR	Census average wage	ESTIMATED YEARLY EARNINGS PER CAPITA	
		Full-time	Actual
1899	$426	$525	$446
1904	477	590	483
1909	518	643	557
1914	580	719	576
1919	1,158	1,433	1,212
1921	1,180	1,462	1,047
1923	1,267	1,566	1,317

described in the following pages. It will be noted that in every case the average wage figures fall short of the estimated full-time earnings figures by wide margins. The margin by which they fall short of them, however, is constant. It will be noticed, further, that there seems to be no constant relation whatever between the average wage figures and the figures in the last column of the table, which are estimated actual yearly earnings. In fact, the census average figures, although usually lower even than the actual yearly earnings figures, in two instances at least are higher than the latter figures. It is perhaps significant that the two census years (1914 and 1921) in which the average wage figures exceed estimated actual earnings figures are years of business depression; in the year 1904, too, which was rather a poor year, the average wage approached nearer to the estimated actual money earnings than in the census years which happened to come at times when business was prosperous.

It may be said that the figures in Table 128 constitute no proof at all but, after a fashion, beg the question, because the estimated

[1] See initial paragraph of this chapter, p. 269.

figures in the second and third columns are worked out on the assumption that certain things are wrong with the census average and then used to prove that these things are wrong with the census average. This is hardly true, however, since the primary foundation for the figures in the second and third columns is not the census average at all, but entirely independent earnings items originating in a special census investigation covering the year 1904.

Additional evidence relevant to this question is to be found in the report of an inquiry made by a special committee appointed by the Director of the Census, January 15, 1906, "to investigate this question [of the method of obtaining the average number of wage earners and of computing average wages] with such celerity as is compatible with thoroughness and report their conclusions in writing." Upon the recommendation of this committee a limited field inquiry was made to check up and make comparisons with the regular census returns for the average number of wage earners and their average annual earnings. The results of this special inquiry, thrown alongside of the corresponding figures from the regular census returns, are presented in Table 129.

It is evident from the results shown in this table that the "average annual earnings" reported by the special committee were higher by 24.8 per cent than the census average wage, that is, the average shown under the box heading "Census schedule." The former figure was $618, the latter $495. Unfortunately the returns from the special committee's field inquiry cover only a very small sample of the field (seven establishments) and one's conclusion from them probably should be heavily discounted on that score. For the same reason, it is impossible to make any comparison between the results of the special committee's inquiry and the estimates worked out in this monograph for the industries which are represented by the seven establishments in Table 129.

One final check upon the statement that the average wage item not only falls far short of measuring the actual amount of full-time earnings but also that it runs first above and then below the amount of actual money earnings, may be had in a comparison of the figures of columns A and E in Table 17, page 48, where the census average wage is compared with estimates of per capita money earnings made by the National Bureau of Economic Research. The national bureau's data, there given, show average actual annual earnings for factory wage earners for 1909 and 1910 of $499 for the earlier and $548 for the later year.[18] The census average wage figures for those

[18] The figures published by the national bureau include clerical and office employees. The figures given here are exclusive of clerical labor and have been courteously placed at the disposal of the writer in advance of publication. The corresponding figures in the bureau's published report (Income in the United States, Vol. I, p. 102) are: 1909, $571; 1910, $620.

two years (the estimate for 1910 being interpolated) are, respectively, $518 and $529. It appears that the census average wage item misses by wide margins the amounts estimated by the National Bureau of Economic Research as the average actual earnings for manufacturing wage earners.

As a result of these considerations, the census average wage item has been discarded entirely except in so far as it can be used to show

TABLE 129.—THE AVERAGE NUMBER OF WAGE EARNERS, TOTAL AMOUNT PAID TO WAGE EARNERS, AND THE ANNUAL AVERAGE EARNINGS FOR SEVEN ESTABLISHMENTS AS COMPUTED FROM THE CENSUS RETURNS FOR 1904, AND THE SPECIAL WAGE INVESTIGATION RETURNS, SHOWING THE DIFFERENCE IN EACH CASE (+ OR − THE CENSUS SCHEDULE) AND THE PER CENT OF DIFFERENCE BETWEEN THEM, ASSUMING THE RETURNS UPON THE SPECIAL SCHEDULE TO BE CORRECT[1]

Establishment	KIND OF PRODUCT	AVERAGE NUMBER OF WAGE EARNERS			TOTAL AMOUNT PAID TO WAGE EARNERS		
		Census schedule	Special schedule	Difference (+ or − census schedule)	Census schedule	Special schedule	Difference (+ or − census schedule)
	Average	196	161	−35	$112,505	$108,206	−$4,299
1	Ingrain carpet	80	45	−35	21,156	22,525	+1,369
2	Art squares	96	77	−19	49,374	44,255	−5,119
3	Foundry and machine-shop products	383	330	−53	221,631	220,094	−1,537
4	Foundry and machine-shop products	485	433	−52	330,395	316,231	−14,164
5	Furniture (fine cabinetwork)	128	103	−25	88,500	72,718	−15,782
6	Glass (bottles and jars)	114	70	−44	55,876	[2] 55,876	
7	Sewing-silk thread and machine twist	83	73	−10	20,607	25,745	+5,138

Establishment	KIND OF PRODUCT	ANNUAL AVERAGE EARNINGS			PER CENT OF DIFFERENCE		
		Census schedule	Special schedule	Difference (+ or − census schedule)	Average number wage earners	Total amount paid to wage earners	Average earnings
	Average	$495	$618	+$123	−17.9	−3.8	+24.8
1	Ingrain carpet	264	500	+236	−43.7	+6.5	+89.4
2	Art squares	514	574	+60	−19.8	−10.4	+11.7
3	Foundry and machine-shop products	578	666	+88	−13.8	−0.7	+15.2
4	Foundry and machine-shop products	681	730	+49	−10.7	−4.3	+7.2
5	Furniture (fine cabinetwork)	691	706	+15	−19.5	−17.8	+2.2
6	Glass (bottles and jars)	490	798	+308	−38.6		+62.9
7	Sewing-silk thread and machine twist	248	352	+104	−12.0	+24.9	+41.9

[1] Special reports of the Census Bureau, Manufactures, Pt. I, 1905, p. xc.
[2] The special agent did not obtain the total amount of wages paid by this establishment, and the amount reported on the census schedule has been accepted for purposes of comparison.

the degree of change in full-time earnings. It would be fortunate, for our purpose, if the census average could be shown to reflect changes in actual earnings, because these latter constitute our chief objective. Since it does not do so, we seem forced to rely upon a somewhat circuitous procedure in order to arrive at (1) the degree of change in actual earnings; and (2) the amounts, both of actual and (hypothetical) full-time earnings, the latter emerging as an

incidental by-product of this procedure (without our having much use for them). The way in which the census average wage[1] is converted into an index number of full-time annual earnings per capita and the method by which to this series of index numbers is tied to an estimated *amount* of full-time yearly earnings for the year 1904, from which, in turn, estimated amounts of full-time yearly earnings for all census years are derived by application of this series of index numbers, are described in the chapter following.

Before undertaking that detailed explanation, it should be pointed out that wherever a figure appears in the census average wage column for the year 1925, it should be understood that that figure is not derived from the census records, but is estimated on the basis of the changes in per capita earnings between 1923 and 1925 reported for all industries combined and for a few single industries by the United States Bureau of Labor Statistics and the State Bureaus of Labor Statistics of New York, Massachusetts, and Wisconsin. This special estimate is more fully explained in Chapter XIX. It is used only in connection with figures for all industries combined and for 12 of the 41 selected industries covered in this monograph. In other words, the census average wage item for 1925 is on a footing with average wage items estimated for intercensal years, rather than on a footing with those items for the census years. The method of estimating the average wage item for the intercensal years is described in Chapter XIX.

FORMULA FOR THE CENSUS METHOD

The census method for computing the average number of wage earners may be put in the shape of a formula:

Let

n = Census average number of wage earners.

t = Time in operation in months.

and $w_1 \text{--------} t$ = the number of wage earners on the pay roll each month.

Then the census procedure is:

$$n = \frac{\Sigma(w_1 \text{--------} t)}{12}$$

Similarly, the method of computing the census average wage[1] may be expressed as follows:

Let

x = Census average wage.

t = Time in operation in months.

$w_1 \text{--------} t$ = Number of wage earners on the pay roll each month.

p = Total wage payment.

and n = Census average number of wage earners.

[1] See initial paragraph of this chapter, p. 269.

Then the procedure is:

$$x=\frac{p}{n}\,.$$

or

$$x=\frac{p}{\frac{\Sigma(w_1\text{--------}t)}{12}}$$

$$x=p\ \cdot\frac{12}{\Sigma(w_1\text{-----}t)}$$

$$x=\frac{p}{\Sigma(w_1\text{------}t)}\ \cdot\ 12$$

That is to say, the total wages divided by the aggregate of the numbers of wage earners on the mid-month pay rolls for the months of actual operation gives the average monthly earnings of each man employed. This latter monthly average multiplied by 12 gives the amount he would earn if and when he is employed throughout the year—and this is the census average wage.[1]

[1] See initial paragraph of this chapter, p. 269.

Chapter XIV

ESTIMATION OF FULL-TIME MONEY EARNINGS AND OF THE DEGREE OF CHANGE THEREIN

It would appear from the appraisal of the census average wage[1] made in the last chapter that its chief merit lies in the fact that, when a series of such average wage items, extending over a number of census years, is converted into relatives, these relatives measure quite accurately the changes in per capita, full-time, annual earnings. In this chapter an effort is made to explain how, by resort to the use of such relatives in connection with a special investigation of the earnings of wage earners made by the Census Bureau in 1904, it has been possible to arrive at estimates of the amounts of full-time money earnings.

CENSUS BUREAU'S INVESTIGATION OF WEEKLY EARNINGS IN 1904

The special investigation referred to was made under the supervision of W. M. Steuart, the present Director of the Bureau of the Census, and at that time chief statistician for manufactures. The inquiry covered manufacturing operations of the census year 1904. Schedules were submitted to each establishment that was in operation during any portion of the calendar year. According to the published report of the investigation, returns from the individual establishments "were prepared from an actual record of pay rolls or from information furnished by the proprietor or someone in authority who was familiar with actual earnings. Verbal statements were accepted only when there were less than 10 wage earners reported by the establishment * * * ."[2]

The reports of this investigation covered the busiest week, or a representative week, in the year 1904. In securing original data the agents of the Census Bureau were given the following instructions:

> This information is required for the three classes of employees—men 16 years and over, women 16 years and over, and children under 16 years of age—and is merely a transcript of the pay roll for the week in which the largest number was employed during the year, arranged so as to show the number of men, women, and children, respectively, at the specified earnings for the week. The distribution of the employees must be made according to actual earnings, not rates of pay. For instance, if an employee is rated at $6 per week and works only three days during the week selected, he should be included in the group "$3 and over, but under $4." By consulting the pay roll for the week selected the number receiving

[1] See initial paragraph of Ch. XIII, p. 269.

[2] Earnings of Wage Earners, Bull. 93, Bureau of the Census, p. 10.

each amount can be tallied in the schedule so as to obtain the desired result. In some instances it may be necessary to supplement the information on the pay roll by inquiry concerning the number of women and children, respectively, employed, but any person familiar with the personnel of the employees can supply the number for each group. The answer to the inquiry must be for the period of one week. If the pay roll is for any other period, it must be reduced to a weekly basis before the figures are entered. If the establishment has no pay roll, secure and enter an estimate of the number at each weekly group. Give also the total amount paid as wages to men, women, and children separately for the week selected. The total wages for the week should not be less than the minimum or greater than the maximum as computed from the weekly earnings. It is essential that the segregation of the employees be made from a pay roll. In order that the office may be fully advised as to the source of the information the agent must, in every instance, write on the margin of the schedule, opposite this inquiry, "Obtained from a pay roll," or, if the answer is estimated, the word "Estimated."[3]

It is evident from the above instructions that what was done in this special investigation was to secure, for a representative week of full operation in the industry concerned, a record of actual earnings received by the wage earners of each establishment. These earnings were reported in the form of frequency distributions, showing the numbers of wage earners receiving earnings within classified groups. The reports for the different establishments, of course, were not all for the same week, since a representative week in one industry or locality is necessarily likely to come at a different season of the year from the representative week in another industry or locality.

The statistics published in the report, then, are a compilation of the returns for the different weeks selected for the individual establishments. In those cases where it was difficult to obtain for any plant a report for a week during which the largest number of wage earners was employed, the report was prepared for a "representative week."

SCOPE OF THE 1904 INVESTIGATION

The representativeness of the returns in the 1904 inquiry is indicated in some detail in Table 130. Additional information on the same point is given above in Table 14. In Table 130 we have, by industry, the number of establishments covered in the special inquiry reported in Census Bulletin 93, the number of wage earners employed in those establishments in the week for which earnings were reported and the percentage this number bears to the greatest number employed at any one time during that year in all the factories covered by the regular census of manufactures. It will be seen that, for "all industries" the factories reporting earnings had in their employ (during the week for which the earnings were reported) 47 per cent of the maximum number of wage earners employed during the year in all of the factories throughout the country. Among 41 industries,

[3] Census, of Manufactures, 1905, Pt. IV, p. 643.

which are selected for the analysis made in this book, the percentage ranges from 27.1 in women's clothing to 85.6 in steam-railroad car construction.

It may be remarked, also, that the wage earners in the establishments covered by the special investigation of 1904, constituted, in the specified week for which the figures were taken in the different establishments, 60.3 per cent of the average number of wage earners

TABLE 130.—NUMBER OF WAGE EARNERS IN SELECTED ESTABLISHMENTS IN WEEK OF 1904 FOR WHICH EARNINGS WERE REPORTED AND CORRESPONDING NUMBER OF ESTABLISHMENTS, BY SELECTED INDUSTRIES

INDUSTRY	Number of establishments reporting weekly earnings	WAGE EARNERS IN SPECIFIED WEEK, SELECTED ESTABLISHMENTS [1]		INDUSTRY	Number of establishments reporting weekly earnings	WAGE EARNERS IN SPECIFIED WEEK, SELECTED ESTABLISHMENTS [1]	
		Number	Per cent of maximum [2]			Number	Per cent of maximum [2]
All industries	123,703	3,297,819	47.0	Lumber and planing-mill products	2,866	50,787	41.8
Bread and other bakery products	13,493	59,079	65.0	Paper and wood pulp	381	38,294	50.6
Flour and grist mill products	7,382	30,931	63.8	Printing and publishing, book and job	4,802	52,916	49.6
Slaughtering and meat packing	617	35,818	39.6	Printing and publishing, newspapers and periodicals	10,860	64,551	57.9
Confectionery and ice cream	816	20,455	42.7	Chemicals	155	11,396	50.8
Liquors, malt	918	28,446	51.9	Petroleum refining	58	15,278	77.9
Mineral and soda waters	2,542	9,552	65.2	Brick, and tile, pottery, terra-cotta, and fire-clay products	2,473	65,945	37.1
Tobacco, cigars and cigarettes	9,033	84,292	51.4	Glass	171	36,368	41.5
Carpets and rugs, other than rag	36	10,512	29.0	Iron and steel, blast furnaces	82	23,839	50.3
Clothing, men's	1,697	47,344	29.9	Iron and steel, steel works and rolling mills	192	119,069	46.5
Clothing, women's	1,072	40,312	27.1	Foundry and machine-shop products	5,359	246,177	57.8
Cotton goods	525	202,211	57.5	Smelting and refining	44	13,391	41.5
Dyeing and finishing textiles	179	20,195	50.5	Automobile bodies and parts	31	890	29.7
Knit goods	416	45,347	38.8	Automobiles	86	10,849	74.4
Silk goods	205	30,486	33.6	Cars, steam-railroad	46	47,249	85.6
Woolen and worsted goods	474	89,684	63.0	Railroad repair shops—electric	43	6,752	53.7
Shirts	242	16,765	39.0	Railroad repair shops—steam	713	182,042	66.8
Boots and shoes, not including rubber boots and shoes	745	92,002	52.7	Agricultural implements	362	31,016	49.2
Leather, tanned, curried, and finished	621	40,259	58.8	Electrical machinery, apparatus, and supplies	443	36,875	47.1
Furniture	1,257	56,918	44.3	Rubber and elastic goods	9	16,211	65.7
Lumber and timber products	8,394	177,022	27.6	Shipbuilding, steel	28	22,552	46.7

[1] Establishments from which average weekly earnings are reported.
[2] The greatest number employed at any one time. Census Bull. 93; pp. 17, 98.

in all establishments covered by the regular manufactures census of 1904. The average number of wage earners in the establishments included in the special inquiry, constituted in 1904, 49.1 per cent of the average number of wage earners in all establishments covered by the regular census of 1904. The special inquiry, moreover, included an average number of male wage earners equal to exactly 50 per cent of the total number of men 16 years of age and over,

covered by the regular census of 1904. It included 45.9 per cent of women and 46.2 per cent of children covered by the regular census.

An important feature of this 1904 investigation was that it reported earnings separately by sex and age groups, as well as by industrial and geographic divisions. Advantage has been taken of this fact to attempt the construction of estimates of the amounts of earnings received in the different census years by women and by children, as well as by male wage earners.

The data collected in the special investigation are reported primarily in the form of frequency tables of earnings. The class intervals of weekly earnings in the frequency distribution are $1 to $3, $3 to $4, and then widening after the $9–$10 interval, to a $2, then to a $3 and finally to a $5, interval, being completed with the class "$25 and over." The average weekly earnings reported in the special investigation of 1904 have been used in this monograph as a fixed starting point from which corresponding sums of average weekly earnings for preceding and later census years, and in some cases intercensal years, have been calculated.

Since our purpose in connection with the earnings investigation of 1904 is from its reports of actual earnings in a busy week, to derive estimates of actual yearly earnings it will be worth while perhaps to compare the ranking of the States on the basis of (1) the average weekly earnings as given in the published report of the 1904 inquiry and (2) the census average wage for that year. This comparison is made in Table 131. It is evident that while the ranking is not exactly the same in the two series, yet there is very little difference between them.

The amount, in dollars, of the average weekly earnings reported in Census Bulletin 93 for the busiest week of that year has been taken as representing not full-time earnings but what they are stipulated to be in the report, actual earnings received in a representative week. Of course, in a great many instances earnings in the busiest week do approximate full-time earnings; in some instances they equal or exceed full-time earnings, but it seems to be true that even in the busiest week the extent of employment falls appreciably short of the volume of employment represented by the condition of full-time employment of all wage earners attached to industry. The phrase "full employment" is here used, it should be remembered, in the sense of complete employment at full time (and yet without overtime) of all wage earners attached to any given industry. The available employment statistics indicate that for industry generally, even the periods of maximum prosperity reflect a degree of employment appreciably less than such full employment. In some industries, to be sure, there is so much overtime worked in periods of prosperity by employees on the pay roll, as entirely to make up (or even

more than make up) for the idleness of wage earners attached to the industry but not employed even in this period of prosperity.

These considerations seem to indicate rather definitely that the money sums reported as average weekly earnings in 1904 are generally somewhat less than full-time earnings. Now, the index numbers of census average wage relatives show changes in full-time earnings and not in actual earnings. It is necessary to change the figures of Bulletin 93 in such a way as to show as nearly as possible full-time weekly (and then, yearly) earnings. Next, because our final objec-

TABLE 131.—COMPARISON OF RANK OF STATES (AND ALASKA) FOR AVERAGE WEEKLY EARNINGS AND AVERAGE YEARLY EARNINGS: 1904

STATE	CENSUS BULLETIN 93, 1904		REGULAR 1904 MANUFACTURES CENSUS		STATE	CENSUS BULLETIN 93, 1904		REGULAR 1904 MANUFACTURES CENSUS	
	Average weekly earnings [1]	Rank	Census average wage	Rank		Average weekly earnings [1]	Rank	Census average wage	Rank
Montana	$18.19	1	966	1	Connecticut	$10.34	27	484	26
Nevada	17.76	2	865	2	Oklahoma	10.30	28	513	19
Arizona	16.15	3	828	3	Wisconsin	10.12	29	472	31
Wyoming	15.75	4	688	4	Indiana	10.10	30	467	32
Idaho	14.81	5	673	6	Michigan	9.92	31	464	34
Colorado	14.14	6	692	5	Massachusetts	9.68	32	476	30
Washington	13.84	7	666	7	Iowa	9.67	33	465	33
Alaska	13.83	8	565	15	Texas	9.51	34	499	25
California	13.24	9	644	8	Maine	9.39	35	436	40
Oregon	12.58	10	618	11	Delaware	9.27	36	442	38
New Mexico	12.18	11	619	10	Vermont	9.24	37	459	35
Utah	11.93	12	641	9	Rhode Island	9.19	38	443	37
North Dakota	11.81	13	588	12	Louisiana	9.16	39	453	36
South Dakota	11.69	14	570	14	Florida	9.04	40	375	45
Illinois	11.55	15	549	16	New Hampshire	9.04	41	424	41
Dist. of Columbia	11.16	16	581	13	Maryland	8.60	42	384	43
Minnesota	11.01	17	515	20	Kentucky	8.38	43	409	42
Nebraska	10.89	18	544	17	Arkansas	7.95	44	440	39
Indian Territory	10.82	19	507	21	Mississippi	7.79	45	383	44
Ohio	10.63	20	501	22	Virginia	7.69	46	346	48
Kansas	10.58	21	531	18	Alabama	7.65	47	352	47
West Virginia	10.52	22	483	27	Tennessee	7.51	48	377	46
Pennsylvania	10.51	23	482	28	Georgia	6.10	49	295	49
New Jersey	10.41	24	481	29	North Carolina	4.96	50	250	50
New York	10.40	25	502	23	South Carolina	4.68	51	233	51
Missouri	10.39	26	500	24					

[1] Earnings of wage earners Census Bull. 93, p. 36.

tive is to arrive at, not full-time, but actual yearly earnings, the expanded (full-time) yearly earnings, derived from the 1904 investigation, must be deflated again to actual earnings by resort to unemployment ratios. This circuitous procedure is made necessary because of the nature of the census average wage.[4] The actual weekly earnings of 1904 have to be made full-time earnings in order to apply to them the index numbers of census average wages. This application of indices of census average wages to the estimated full-time yearly earnings for 1904, derived from weekly earnings for that year, makes

[4] See initial paragraph of Ch. XIII, p. 269.

it possible to present estimates of the full-time yearly earnings in each of the other census years. But let it be repeated these latter estimates of full-time annual earnings are not what we seek. In that form they represent, very roughly, annual rates; that is to say, they represent the "salaries" which wage earners would get if they worked continuously throughout the year. It is necessary, therefore, to deflate these sums in order to secure estimates of *actual* earnings for each of the census years. What has been gained by this roundabout procedure is the estimation, on an annual basis, of amounts of earnings for other census years, as well as 1904.

EXPANSION OF ACTUAL TO FULL-TIME WEEKLY EARNINGS

It is necessary to consider now the procedure for the expansion of the average weekly earnings in 1904 to estimated full-time weekly earnings in the same year. The expansion coefficients are derived from New York State figures reporting the per cent of trade unionists unemployed in 1904. The method of derivation of the coefficients is indicated in Table 132. The figures are taken from the reports of the New York Department of Labor for 1904.[5] In column B are given for those New York industries which are identical with or very closely resemble the 41 selected industries which we are including in this monograph, the per cent of trade unionists unemployed in the month when the highest average number of wage earners were employed in New York State. The months to which the percentages refer are listed in column A. In column C are given the complements of figures in column B; they represent, of course, employment ratios as distinguished from the unemployment ratios of the preceding column. Since there would undoubtedly be some considerable error involved in attempting to apply the New York employment ratios, shown in column C to our average weekly earnings in 1904, an effort was made to ascertain the probable relation in 1904 between the extent of employment in New York in different industries and the corresponding extent of employment in those same industries in the United States as a whole. To get at this relation the writer has made use of the unemployment figures published by the census as a part of its population statistics in 1890 and 1900.

For all industries combined, the derivation of this New York-United States correction ratios rests upon a comparison of census figures for 1890 and 1900. The figures for "all industries" are shown in Table 133. The ratios in the last column represent the relation between the United States and New York in respect to the number who were unemployed during some part of the year. Figures are given separately for males and females. Corresponding ratios for

[5] Report of the New York Bureau of Labor Statistics, 1904—Appendix Table F.

separate industry groups are shown in Table 138. The ratios for these industries, however, are based upon the census unemployment figures for 1900 only. In the case of the figures for separate industries, the original census figures for unemployment are not for industries, as such, but for occupations. Thus, in Table 138, the ratios are shown for bakers, millers, confectioners, brewers, tobacco-factory operatives, etc. It has been assumed that these ratios indicate the relative extent of unemployment among bakers, millers, etc., in the United States as compared with New York, and, further, that without serious error they can be assumed to represent the ratio between the degrees of employment, for the cognate industries, between the United States and New York State.

Returning now to Table 132 and the United States correction ratios introduced in column D, these latter ratios are multiplied by the New York trade unionist employment ratios in column C to produce the "estimated ratios actual to full employment in the indicated month in the United States," shown in column E. These are the ratios which are utilized to expand the average weekly earnings in the busiest week in 1904 to estimates of full-time earnings for that week. The New York employment ratios used are for the busiest month and it is presumed that this busiest month is the month containing the busiest week which is reported in Census Bulletin 93. This assumption unquestionably involves some error, but it seems to represent the most accurate method of correction that is possible with the available data.

It should be explained that the data in column A in Table 132, showing the month of highest average of number of wage earners employed, were taken from the manufactures census of 1904, in which are reported the average number of employees on the pay rolls in each month during the census year. These monthly averages are given separately for men and women. In the construction of Table 132, therefore, for all sex and age groups combined and for women separately, the month of maximum employment was listed for all industries and for each separate industry. Opposite this month, in column B, was entered the per cent of trade unionists shown as unemployed in that month. The New York figures are not separately classified according to sex and, for that reason, there is probably very little to be gained by making separate reports for women. It was thought desirable to do so, however, in view of the fact that not only the census employment figures, but also the figures underlying the ratios between New York and United States unemployment in 1900 are separately reported by sex. In all cases where data for earnings are given for women separately, the estimated ratios for women from Table 132 are used. In other cases, that is to say, where men wage earners alone are reported, and where

TABLE 132.—COMPOSITION OF ESTIMATE FOR EXPANDING ACTUAL WEEKLY EARNINGS TO FULL-TIME EARNINGS: 1904

INDUSTRY	ALL SEX AND AGE GROUPS					WOMEN		
	Month in which highest average number of wage earners were employed [1]	Per cent of New York trade unionists unemployed in that month [2]	New York trade unionists employment ratio [3]	United States correction ratio [4]	Estimated ratio, actual to full employment in indicated month: United States	Month in which highest average number of wage earners were employed [1]	Per cent of New York trade unionists unemployed in that month [2]	Estimated ratio, actual to full employment in indicated month: United States
	A	B	C	D	E	A	B	E
All industries [5]	October [6]	10.8	0.892	0.975	0.870	October	10.8	[7] 0.892
Bread and other bakery products	July	10.7	.893	1.010	.901	June	11.3	.887
Confectionery and ice cream	November	16.7	.833	.984	.820	November	16.7	.833
Flour-mill and gristmill products [8]	October	29.0	.710	.980	.870	October	29.0	.710
Mineral and soda waters	July	2.5	.975	.984	.959	July	2.5	.975
Slaughtering and meat packing [9]	December	17.1	.829	.975	.808	December	17.1	.829
Slaughtering, wholesale	November	16.7	.833	.975	.812			
Liquors, malt	July	2.5	.975	.981	.956	July	2.5	.975
Tobacco, cigars and cigarettes [9]	November	2.8	.972	1.036	1.007	November	2.8	.972
Carpets and rugs, other than rag [10]	February	25.6	.744	.915	[11] .870	March	0.0	1.000
Clothing, men's [12]	October	16.2	.838	.945	[13] .838	March	34.3	[11] .892
Clothing, women's [12]	October	16.2	.838	1.111	.931	March	34.3	[11] .892
Cotton goods [10]	January	24.4	.756	1.012	.765	January	24.4	.756
Dyeing and finishing textiles, exclusive of that done in textile mills. [10]	December	14.5	.855	.981	[13] .855	February	25.6	[11] .892
Knit goods [10]	October	7.2	.928	.995	.923	October	7.2	.928
Shirts [12]	February	22.7	.773	1.013	[11] .870	March	34.3	[11] .892
Silk goods, including throwsters [10]	December	14.5	.855	1.021	.873	December	14.5	.855
Woolen goods [10]	March	0.0	1.000	.949	.949	November	5.1	.949
Boots and shoes, not including rubber boots and shoes [14]	March	15.8	.842	.954	.803	March	15.8	.842
Leather, tanned, curried, and finished	March	10.6	.894	.945	[13] .894	October	18.7	.813
Furniture [15]	November	18.5	.815	.975	.795	November	18.5	.815
Lumber and timber products [15]	May	26.3	.737	.966	[11] .870	May	26.3	.737
Lumber, planing-mill products, not including planing mills connected with sawmills. [15]	September	25.2	.748	.906	[11] .870	March	34.4	.656
Paper and wood pulp	October	0.0	1.000	.984	.984	June	0.0	1.000
Printing and publishing, book and job [16]	December	9.4	.906	.994	.901	November	9.8	.902

Printing and publishing, newspapers and periodicals [16]	December	9.4	.906	.904	.901	December	9.4	.906
Chemicals [17]	June	13.7	.863	.903	[12].863	May	15.9	.841
Petroleum refining [17]	June	13.7	.863	1.035	.893	November	11.1	.889
Glass	April	11.6	.884	.975	.862	November	3.2	.968
Iron and steel, blast furnaces	December	10.1	.899	.980	.881			
Iron and steel, steel works and rolling mills	May	14.4	.856	.980	[13].856	December	10.1	.899
Foundry and machine-shop products [18]	April	24.3	.757	.989	.749	December	3.5	.965
Smelting and refining [17]	December	3.5	.965	.975	.941			
Automobile bodies and parts [17]	June	13.7	.863	1.088	.939	January	25.8	.742
Automobiles [17]	June	13.7	.863	1.088	.939			
Cars, steam-railroad, not including operations of railroad repair shops.[19]	August	10.0	.900	.916	.824	January	13.7	.863
Railroad repair shops—electric [18]	April	13.3	.867	.916	.794			
Railroad repair shops—steam [19]	December	8.8	.912	.916	.835	December	8.8	.912
Agricultural implements [19]	March	13.0	.870	.975	.848	March	13.0	.870
Rubber goods [17]	December	19.6	.804	.975	.784	November	11.1	.889
Shipbuilding, steel	April	7.4	.926	.975	.903			
Electrical machinery, apparatus, and supplies [19]	January	13.7	.863	.975	.841	November	8.8	.912

[1] From data showing "average number of wage earners employed during each month." Manufactures census, 1905, Pt. I, pp. lxxix, 30–67.
[2] Reports of New York Bureau of Labor Statistics. The figures are for all sexes and all ages combined.
[3] Complements of figures in col. B, except where noted.
[4] From a comparison of New York and United States unemployment statistics. Occupations census of 1900: For "All industries" both 1890 and 1900 are used. See Table 133.
[5] For all industries combined, the col. E ratios for "men" and "children" are .864 and .880, respectively.
[6] Average number employed this month 5,677,732. Greatest number employed at any one time during year 7,017,138.
[7] Basis: Correction ratio of 1.00 for women.
[8] New York figures (in col. B) are for "Food preparations."
[9] New York figures are for "Tobacco."
[10] New York figures are for "Textiles."
[11] Ratio for "All industries."
[12] New York figures are for "Garments."
[13] Unadjusted New York ratio.
[14] New York figures are for "Boots, shoes, and gloves."
[15] New York figures are for "Wood working and furniture."
[16] New York figures are for "Printing, binding, etc."
[17] New York figures are for "All industries combined" (p. 49 U. S. Bureau of Labor Statistics Bul. 310)
[18] New York figures are for "Other metals (metals, machinery, and shipbuilding group)."
[19] New York figures are for "Metals, machinery, shipbuilding (recapitulation)."

there is no separation of sex, the United States correction ratios, shown in Table 132, have been utilized.

The method of applying the estimated ratios of actual to full employment for the busiest month of 1904, to the average weekly earnings in the busiest week in that year, is indicated in Table 134. The average weekly earnings in 1904 are divided by the ratios in column CX, taken from Table 132, the result being the estimated full-

TABLE 133.—COMPARISON OF EXTENT OF UNEMPLOYMENT IN NEW YORK AND THE UNITED STATES FOR MEN AND WOMEN AND FOR BOTH SEXES COMBINED: 1890 AND 1900 [1]

AREA AND SEX	PERSONS 10 YEARS OF AGE AND OVER IN GAINFUL OCCUPATIONS			Percentage employed	Ratio, United States to New York [2]
	Total	Unemployed during some part of year			
		Number	Per cent		
1890					
United States:					
Male	4,064,051	900,572	22.16	77.8	97.0
Female	1,027,242	167,832	16.34	83.7	100.4
Total	5,091,293	1,068,404	21.0	79.0	97.7
New York:					
Male	634,430	125,795	19.8	80.2	100.0
Female	193,786	32,264	16.6	83.4	100.0
Total	828,216	158,059	19.1	80.9	100.0
1900					
United States:					
Male	5,772,641	1,631,057	28.3	71.7	96.6
Female	1,312,668	294,346	22.4	77.6	101.5
Total	7,085,309	1,925,403	27.2	72.8	97.3
New York:					
Male	788,317	203,139	25.8	74.2	100.0
Female	246,240	57,682	23.4	76.6	100.0
Total	1,034,557	260,821	25.2	74.8	100.0

[1] Figures are for gainfully employed persons in the continental United States in manufacturing and mechanical industries and are taken from the Occupations Census. Figures for 1890, U. S. census 1890: Population, Pt. II. Figures for 1900, U. S. census 1900, special reports: Occupations.
[2] The averages of 1890 and 1900 ratios are, for males, 96.9; females, 100.2; and total, 97.5.

time weekly wages for the year 1904 shown in column D. The corresponding estimated full-time weekly wages for the other census years are then obtained by multiplying the 1904 amount by the relatives shown in column B. Thus 11.56 multiplied by 0.89 gives 10.29, the estimated full-time weekly wages for 1899. The estimated full-time yearly earnings in column I are then calculated by multiplying weekly figures in preceding columns by 51, it being assumed that 51 weeks constitute a full year.[6]

[6] The selection of 51 weeks as representing a full-time year was made only after very careful consideration of the alternatives. Obviously, any period short of 51 weeks would hardly represent full-time operation; yet, even in continuous industries it is not uncommon, even in years of good business, for factories to shut down entirely for a week. At any rate, in view of the handful of holidays in which factories customarily shut down, it has seemed unwise to take 52 weeks as the full-time year. The Census Bureau, furthermore, considers 307 days (51 six-day weeks) a full-time year. In industrial accidents statistics 300 days are generally taken to represent a full-time year. (Bureau of Labor Statistics Bull. 276, p. 69.)

Since the process of expansion (which in a few cases of much overtime, is one of contraction) of the average weekly earnings reported in Census Bulletin 93, to estimated full-time weekly earnings for the same year, is of considerable importance, the figures used in making the adjustment for the different industrial and regional groups are given in Tables 135 and 137 and in Tables 139 and 140 at the end of this chapter.

TABLE 134.—CENSUS AVERAGE WAGE, AVERAGE WEEKLY MONEY EARNINGS IN 1904, ESTIMATED FULL-TIME WEEKLY EARNINGS, AND ESTIMATED FULL-TIME YEARLY EARNINGS, ALL INDUSTRIES COMBINED, BY SEX AND AGE GROUP: 1899–1923

YEAR	Average wage A	Relatives 1904=100 B	Average weekly (money) earnings in 1904 C	Estimated ratio, actual to full employment for month of 1904 involved in column C CX	Estimated full-time (money) weekly wages D	Estimated full-time yearly earnings I
United States:						
1899	$426	$0.89			$10.29	$525
1904	477	1.00	$10.06	0.870	11.56	590
1909	518	1.09			12.60	643
1914	580	1.22			14.10	719
1919	1,158	2.43			28.09	1,433
1921	1,180	2.48			28.67	1,462
1923	1,267	2.63			30.35	1,566
Men:						
1899	426	.89			11.50	587
1904	477	1.00	11.16	.864	12.92	659
1909	518	1.09			14.08	729
1914	580	1.22			15.76	804
1919	1,158	2.43			31.40	1,601
1921	1,180	2.48			32.04	1,634
1923	1,267	2.63			33.85	1,726
Women:						
1899	426	.89			6.16	314
1904	477	1.00	6.17	.892	6.92	353
1909	518	1.09			7.54	391
1914	580	1.22			8.44	430
1919	1,158	2.43			16.82	858
1921	1,180	2.48			17.16	875
1923	1,267	2.63			18.13	925
Children:						
1899	426	.89			3.50	179
1904	477	1.00	3.46	.880	3.93	222
1909	518	1.09			4.28	202
1914	580	1.22			4.79	244
1919	1,158	2.43			9.55	487
1921	1,180	2.48			9.75	497
1923	1,267	2.63			10.30	525

The details of the expansion process, with the estimated full-time weekly earnings for the year (1904) are given by selected industry in Table 135. The figures in the first column come from Census Bulletin 93; those in the second from (or by the method shown in) Table 132; those in the third from a source entirely separate and by a method quite distinct[7] from the source and method utilized in this

[7] These figures, introduced in Tables 135, 137, 139, and 140, for purposes of comparison merely, were worked out (as explained in Chs. XV and XVI) for the purpose of reducing "full-time yearly earnings" to actual yearly earnings. The ratios are given for each of the selected industries and for all census years in Table 152.

chapter; those in the fifth and last column from a simple division of the figure in the first column by that in the second.

TABLE 135.—AVERAGE WEEKLY EARNINGS REPORTED FOR 1904 IN CENSUS BULLETIN 93, AND ESTIMATED RATIOS OF ACTUAL TO FULL EMPLOYMENT IN THAT YEAR, BY INDUSTRIES

INDUSTRY	Sex	Average weekly earnings reported in Census Bulletin 93	ESTIMATED RATIO, ACTUAL TO FULL EMPLOYMENT		Estimated full-time weekly earnings, 1904
			For month of 1904 covered in Census Bulletin 93	For year 1904 [1] (male and female)	
All industries	Total	$10.06	0.870	0.819	$11.56
	Men	11.16	.864		12.92
	Women	6.17	.892		6.92
	Children	3.46	.880		3.93
Bread and other bakery products	Male	11.77	.901	.821	13.06
	Female	5.46	.887		6.15
Flour and gristmill products	Male	10.03	.870	.821	11.53
Confectionery	Male	10.27	.820	.759	12.52
	Female	4.83	.833		5.80
Slaughtering and meat packing	Male	11.27	.844	.844	13.35
Liquors, malt	Male	14.37	.956	.890	15.03
Mineral and soda waters	Male	9.86	.959	.888	10.28
	Female	5.09	.975		5.22
Tobacco, cigars and cigarettes	Male	11.14	1.007	.829	11.06
	Female	5.97	.972		6.14
Carpets and rugs, other than rag	Male	9.93	.870	.815	11.41
	Female	7.31	1.000		7.31
Shirts	Male	10.20	.870	.815	11.72
	Female	5.69	.892		6.38
Clothing, men's	Male	12.23	.838	.815	14.59
	Female	6.07	.892		6.80
Clothing, women's	Male	13.52	.931	.815	14.52
	Female	6.85	.892		7.67
Cotton manufactures	Male	7.71	.870	.840	8.86
	Female	6.03	.870		6.93
Dyeing and finishing textiles	Male	9.51	.855	.815	11.12
	Female	5.99	.892		6.72
Knit goods	Male	8.90	.923	.815	9.64
	Female	6.01	.928		6.47
Silk goods	Male	10.57	.873	.815	12.11
	Female	6.11	.855		7.15
Woolen and worsted goods	Male	9.52	.949	.765	10.03
	Female	6.83	.949		7.20
Boots and shoes, not including rubber boots and shoes.	Male	11.88	.870	.856	13.66
	Female	7.60	.870		8.74
Leather, tanned, curried, and finished	Male	9.90	.894	.802	11.07
Furniture	Male	10.16	.802	.802	12.67
Lumber, timber products	Male	9.25	.870	.802	10.63
Lumber, planing-mill products, not including planing mills connected with sawmills.	Male	11.15	.870	.802	12.82
Paper and wood pulp	Male	10.64	.984	.917	10.81
Printing and publishing, book and job	Male	12.94	.901	.873	14.36
	Female	6.54	.902		7.25
Printing and publishing, newspapers and periodicals.	Male	13.13	.901	.873	14.57
	Female	5.95	.906		6.57
Chemicals	Male	10.91	.946	.884	11.53
Petroleum refining	Male	12.31	.939	.876	13.11
Brick and tile, terra-cotta, and fire-clay products	Male	9.82	.883	.878	11.12
Glass	Male	14.10	.877	.848	16.36
	Female	5.09	.968		5.25
Iron and steel, blast furnaces	Male	11.71	.881	.748	13.29
Iron and steel, steel works and rolling mills	Male	12.56	.856	.748	14.67
Foundry and machine-shop products	Male	11.88	.749	.745	15.86
Smelting and refining	Male	13.82	.941	.769	14.69
Automobile bodies and parts	Male	11.05	.939	.701	11.77

[1] From Table 152. The derivation of these employment ratios for the whole year 1904 is worked out entirely independently of the ratios for the peak month in 1904 and for use in expanding the earnings data of Census Bull. 93. These ratios are for all sex and age groups combined. They are inserted in the table merely for purposes of comparison.

TABLE 135.—AVERAGE WEEKLY EARNINGS REPORTED FOR 1904 IN CENSUS BULLETIN 93, AND ESTIMATED RATIOS OF ACTUAL TO FULL EMPLOYMENT IN THAT YEAR, BY INDUSTRIES—Continued

INDUSTRY	Sex	Average weekly earnings reported in Census Bulletin 93	ESTIMATED RATIO, ACTUAL TO FULL EMPLOYMENT		Estimated full-time weekly earnings, 1904
			For month of 1904 covered in Census Bulletin 93	For year 1904 (male and female)	
Automobiles	Male	$13.07	0.939	0.701	$13.92
Cars, steam-railroad	Male	11.21	.824	.560	13.60
Railroad repair shops—electric	Male	12.55	.794	.732	15.81
Railroad repair shops—steam	Male	12.47	.835	.732	14.93
Agricultural implements	Male	10.97	.848	.658	12.94
Rubber goods	Male	11.25	.804	.658	13.99
Shipbuilding, steel	Male	11.32	.903	.658	12.54
Electrical machinery, apparatus, and supplies	Male	10.85	.841	.658	12.90
	Female	6.37	.912		6.98

The same construction shown in Table 135 is given for geographic regions and divisions in Table 137. The method of constructing this latter table is indicated in Table 136. The first two columns of the latter table show the total population in the different regions in 1900 and the proportions of that population unemployed at some time in that year. The third column (by use of complementary percentages) shows the proportions employed in 1900. The fourth column, derived from the one preceding, gives the ratio of each region to the United States. These regional ratios, finally, are multiplied by the United States ratio, 0.870 (calculated as shown in Table 132) to produce corresponding regional ratios, which are used in computing the results presented in Parts II and III of this monograph, on the assumption that they represent for each geographic division the ratio of actual

TABLE 136.—DERIVATION OF RATIOS, ACTUAL TO FULL EMPLOYMENT, FOR REPRESENTATIVE WEEK OF 1904, BY GEOGRAPHIC REGIONS AND DIVISIONS

REGION	Number unemployed, 1900 [1]	Per cent of total	Per cent employed	Ratio of region to United States	Ratio of actual to full employment [2]
UNITED STATES	1,925,403	27.2	72.8	100.0	0.870
North Atlantic	865,888	25.7	74.3	102.1	.886
South Atlantic	157,924	25.2	74.8	102.7	.892
North Central	638,776	29.5	70.5	96.8	.841
South Central	139,198	28.6	71.4	98.1	.852
Western	123,617	28.1	71.9	98.0	.857
Northeast [3]					.867
South [3]					.875
West					.857

[1] At some time during the year, in manufacturing and mechanical pursuits, U. S. census, 1900. Special reports: Occupations, p. ccxxxv.

[2] Assumed to apply to 1904 and used for expansion of weekly earnings data in Census Bull. 93. Computed by geographic divisions by multiplying 0.870, ratio for United States (all industries), by index in preceding column.

[3] Weighted average from above fivefold regional division, weight being number of wage earners in 1904.

to full employment in a representative week in 1904. They are not so used, however, in exactly the form in which they appear in Table 136. The regional classification used is the ninefold one shown in Table 137, which indicates just how the average weekly earnings data published in Census Bulletin 93 are treated in order to convert them into (estimates of) full-time weekly earnings.

TABLE 137.—AVERAGE WEEKLY EARNINGS REPORTED FOR 1904 IN CENSUS BULLETIN 93, AND ESTIMATED RATIOS OF ACTUAL TO FULL EMPLOYMENT IN THAT YEAR, BY GEOGRAPHIC REGIONS

REGION	Average weekly earnings reported in Census Bulletin 93	ESTIMATED RATIO, ACTUAL TO FULL EMPLOYMENT		Estimated full-time weekly earnings, 1904
		For month of 1904 covered in Census Bulletin 93	For year 1904 [1]	
UNITED STATES	$10.06	0.870	0.819	$11.56
NORTHEAST	[2] 10.34	[2] .870	.817	11.93
New England	9.67	.886	.817	10.91
Middle Atlantic	10.45	.886	.817	11.79
East North Central	10.66	.841	.817	12.68
West North Central	10.47	.841	.817	12.45
SOUTH	[2] 7.67	[2] .877	.799	8.79
South Atlantic	7.31	.892	.799	8.20
East South Central	7.86	.852	.799	9.23
West South Central	9.07	.852	.799	10.65
WEST	[2] 13.68	.857	.848	15.96
Mountain	14.84	.857	.848	17.32
Pacific	13.29	.857	.848	15.51

[1] From Table 153. Derived from entirely different sources from figures in preceding column. See footnote to Table 135. This column inserted merely for purposes of comparison.
[2] Weighted averages of corresponding figures for 9 geographic divisions; weights used being the average numbers (in round figures) of wage earners employed in the several divisions in 1904.

TABLE 138.—PROPORTION OF GAINFULLY EMPLOYED IN MANUFACTURING AND MECHANICAL PURSUITS WHO WERE UNEMPLOYED SOME PART OF THE YEAR 1900, SHOWING THE UNITED STATES TOTAL AND NEW YORK AS A TOTAL AND BY SEX

OCCUPATION, AREA, AND SEX	Aggregate number in the occupation	UNEMPLOYED			Total unemployed	Per cent number unemployed is of aggregate in occupation	Per cent employed	Ratio, United States to New York, New York = 100
		1-3 months	4-6 months	7-12 months				
Manufacturing and mechanical pursuits	7,112,304				1,933,282	27.2	72.8	97.3
New York	1,034,557	136,417	95,792	28,612	260,821	25.2	74.8	
Male	788,317	103,775	76,823	22,541	203,139			
Female	246,240	32,642	18,969	6,071	57,682			
Bakers	79,407				8,888	11.2	88.8	101.0
New York	17,279	1,131	628	336	2,095	12.1	87.9	
Male	16,600	1,105	600	323				
Female	679	26	28	13				
Millers	40,576				4,720	11.6	88.4	98.0
New York	3,117	108	88	109	305	9.8	90.2	
Male	3,117	108	88	109				
Female								

TABLE 138.—PROPORTION OF GAINFULLY EMPLOYED IN MANUFACTURING AND MECHANICAL PURSUITS WHO WERE UNEMPLOYED SOME PART OF THE YEAR 1900, SHOWING THE UNITED STATES TOTAL AND NEW YORK AS A TOTAL AND BY SEX—Continued

OCCUPATION, AREA, AND SEX	Aggregate number in the occupation	UNEMPLOYED			Total unemployed	Per cent number unemployed is of aggregate in occupation	Per cent employed	Ratio, United States to New York, New York=100
		1-3 months	4-6 months	7-12 months				
Confectioners	31,242				3,995	12.8	87.2	98.4
New York	6,105	390	221	82	693	11.4	88.6	
Male	4,302	233	148	55				
Female	1,803	157	73	27				
Brewers and maltsters	20,984				2,552	12.2	87.8	98.1
New York	4,319	226	134	95	455	10.5	89.5	
Male	4,319	226	134	95				
Female								
Bottlers and soda-water makers	10,546				1,298	12.3	87.7	98.4
New York	2,230	127	88	27	242	10.9	89.1	
Male	2,230	127	88	27				
Female								
Tobacco and cigar factory operatives	131,464				37,496	28.5	71.5	103.6
New York	26,269	4,992	2,582	567	8,141	31.0	69.0	
Male	17,292	2,845	1,476	409				
Female	8,977	2,147	1,106	158				
Carpet factory operatives	19,372				4,791	24.7	75.3	91.5
New York	5,910	756	194	98	1,048	17.7	82.3	
Male	2,517	270	105	40				
Female	3,393	486	89	58				
Tailors (and tailoresses)	230,277				61,602	26.8	73.2	116.0
New York	88,762	18,946	12,013	1,818	32,777	36.9	63.1	
Male	65,180	14,362	9,409	1,251				
Female	23,582	4,584	2,604	567				
Seamstresses	151,379				37,025	24.5	75.5	106.2
New York	27,770	4,839	2,589	602	8,030	28.9	71.1	
Male	2,990	738	383	43				
Female	24,780	4,101	2,206	559				
Cotton-mill operatives	246,391				34,396	14.0	86.0	101.2
New York	5,105	440	198	128	766	15.0	85.0	
Male	2,428	194	98	56				
Female	2,677	246	100	72				
Bleachery and dyeworks operatives	22,289				4,261	19.1	80.9	98.1
New York	2,084	188	131	46	365	17.5	82.5	
Male	1,872	172	115	40				
Female	212	16	16	6				
Hosiery and knitting-mill operatives	47,120				9,444	20.0	80.0	99.5
New York	11,386	1,319	584	326	2,229	19.6	80.4	
Male	3,935	489	227	120				
Female	7,451	830	357	206				
Shirt, collar, and cuff makers	39,432				8,840	22.4	77.6	101.3
New York	19,542	2,922	1,244	416	4,582	23.4	76.6	
Male	4,002	748	310	67				
Female	15,540	2,174	934	349				
Silk-mill operatives	54,460				14,823	27.2	72.8	102.1
New York	6,153	1,026	521	216	1,763	28.7	71.3	
Male	2,532	426	268	98				
Female	3,621	600	253	118				
Woolen-mill operatives	73,196				14,777	20.2	79.8	94.9
New York	6,072	526	278	164	968	15.9	84.1	
Male	3,333	305	154	91				
Female	2,739	221	124	73				

TABLE 138.—PROPORTION OF GAINFULLY EMPLOYED IN MANUFACTURING AND MECHANICAL PURSUITS WHO WERE UNEMPLOYED SOME PART OF THE YEAR 1900, SHOWING THE UNITED STATES TOTAL AND NEW YORK AS A TOTAL AND BY SEX—Continued

OCCUPATION, AREA, AND SEX	Aggregate number in the occupation	UNEMPLOYED			Total unemployed	Per cent number unemployed is of aggregate in occupation	Per cent employed	Ratio, United States to New York, New York=100
		1-3 months	4-6 months	7-12 months				
Boot and shoe makers and repairers	209,047				70,435	33.7	66.3	87.1
New York	27,539	3,730	1,990	874	6,594	23.9	76.1	
Male	23,374	2,817	1,630	753				
Female	4,165	913	360	121				
Leather curriers and tanners	42,684				10,533	24.7	75.3	94.5
New York	6,468	783	351	178	1,312	20.3	79.7	
Male	6,165	746	332	177				
Female	303	37	19	1				
Saw and planing mill employees	161,687				56,688	35.1	64.9	96.6
New York	6,686	1,062	956	174	2,192	32.8	67.2	
Male	6,686	1,062	956	174				
Female								
Paper and pulp mill operatives	36,329				6,538	18.0	82.0	98.4
New York	6,948	708	320	134	1,162	16.7	83.3	
Male	5,778	606	241	111				
Female	1,170	102	79	23				
Printers, lithographers, and pressmen	155,333				23,548	15.2	84.8	99.4
New York	31,822	2,504	1,434	755	4,693	14.7	85.3	
Male	29,724	2,371	1,342	698				
Female	2,098	133	92	57				
"Other chemical workers," chemical works employees	14,723				2,794	19.0	81.0	90.3
New York	1,994	111	59	36	206	10.3	89.7	
Male	1,807	96	47	33				
Female	187	15	12	3				
Oil-well and oil-works employees	24,626				5,632	22.9	77.1	103.5
New York	1,218	186	103	21	310	25.5	74.5	
Male	1,218	186	103	21				
Female								
Brick and tile makers, etc	49,934				24,064	48.2	51.8	218.6
New York	7,848	1,041	4,711	236	5,988	76.3	23.7	
Male	7,848	1,041	4,711	236				
Female								
Glassworkers	49,999				29,591	59.2	40.8	66.4
New York	4,764	1,171	433	233	1,837	38.6	61.4	
Male	4,551	1,133	424	226				
Female	213	38	9	7				
Iron and steel workers	290,724				81,456	28.0	72.0	98.0
New York	31,540	5,176	2,277	903	8,356	26.5	73.5	
Male	31,252	5,148	2,248	898				
Female	288	28	29	5				
Machinists	283,432				37,962	13.4	86.6	98.9
New York	40,699	2,921	1,350	776	5,047	12.4	87.6	
Male	40,699	2,921	1,350	776				
Female								
Brass workers	26,760				5,263	19.7	80.3	103.3
New York	5,037	714	284	124	1,122	22.3	77.7	
Male	5,037	714	284	124				
Female								
Rubber factory operatives	21,866				7,411	33.9	66.1	82.8
New York	1,476	163	96	39	298	20.2	79.8	
Male	1,053	120	66	29				
Female	423	43	30	10				

TABLE 139.—AVERAGE WEEKLY EARNINGS REPORTED FOR 1904 IN CENSUS BULLETIN 93, ESTIMATED RATIOS, ACTUAL TO FULL EMPLOYMENT, AND ESTIMATED FULL-TIME WEEKLY EARNINGS, BY GEOGRAPHIC REGIONS, DIVISIONS, AND STATES, ALL SEX AND AGE GROUPS COMBINED: 1904

REGION	Average weekly earnings reported in Census Bulletin 93	ESTIMATED RATIO, ACTUAL TO FULL EMPLOYMENT FOR—		Estimated full-time weekly earnings, 1904
		Month of 1904 covered in Census Bulletin 93	Year 1904 [1]	
UNITED STATES	$10.06	0.870	0.819	$11.56
NORTHEAST	10.34	.867	.817	11.93
NEW ENGLAND	9.67	.886	.817	10.91
Maine	9.39	.886	.817	10.60
New Hampshire	9.04	.886	.817	10.20
Vermont	9.24	.886	.817	10.43
Massachusetts	9.68	.870	.817	10.93
Rhode Island	9.19	.886	.817	10.37
Connecticut	10.34	.886	.817	11.67
MIDDLE ATLANTIC	10.45	.886	.817	11.79
New York	10.40	.886	.817	11.74
New Jersey	10.41	.886	.817	11.75
Pennsylvania	10.51	.886	.817	11.86
EAST NORTH CENTRAL	10.66	.841	.817	12.68
Ohio	10.63	.841	.817	12.64
Indiana	10.10	.841	.817	12.01
Illinois	11.55	.841	.817	13.73
Michigan	9.92	.841	.817	11.80
Wisconsin	10.12	.841	.817	12.03
WEST NORTH CENTRAL	10.47	.841	.817	12.45
Minnesota	11.01	.841	.817	13.09
Iowa	9.67	.841	.817	11.50
Missouri	10.39	.841	.817	12.35
North Dakota	11.81	.841	.817	14.04
South Dakota	11.69	.841	.817	13.90
Nebraska	10.89	.841	.817	12.95
Kansas	10.58	.841	.817	12.58
SOUTH	7.67	.875	.799	8.77
SOUTH ATLANTIC	7.31	.892	.799	8.20
Delaware	9.27	.892	.817	10.39
Maryland	8.60	.892	.817	9.64
District of Columbia	11.16	.892	.799	12.51
Virginia	7.69	.892	.799	8.62
West Virginia	10.52	.892	.799	11.79
North Carolina	4.96	.892	.799	5.56
South Carolina	4.68	.892	.799	5.25
Georgia	6.10	.892	.799	6.84
Florida	9.04	.892	.799	10.13
EAST SOUTH CENTRAL	7.86	.852	.799	9.23
Kentucky	8.38	.852	.799	9.92
Tennessee	7.51	.852	.799	8.89
Alabama	7.65	.852	.799	9.06
Mississippi	7.79	.852	.799	9.22
WEST SOUTH CENTRAL	9.07	.852	.799	10.65
Arkansas	7.95	.852	.799	9.41
Louisiana	9.16	.852	.799	10.84
Oklahoma	10.30	.852	.799	12.19
Texas	9.51	.852	.799	11.26
WEST	13.68	.857	.848	15.96
MOUNTAIN	14.84	.857	.848	17.32
Montana	18.19	.856	.848	21.25
Idaho	14.81	.856	.848	17.30
Wyoming	15.75	.856	.848	18.40
Colorado	14.14	.856	.848	16.52
New Mexico	12.18	.856	.848	14.23
Arizona	16.15	.856	.848	18.87
Utah	11.93	.856	.848	13.94
Nevada	17.76	.856	.848	20.75
PACIFIC	13.29	.857	.848	15.51
Washington	13.84	.856	.848	16.17
Oregon	12.58	.856	.848	14.70
California	13.24	.856	.848	15.47

[1] See footnote to Table 135.

TABLE 140.—AVERAGE WEEKLY EARNINGS REPORTED FOR 1904 IN CENSUS BULLETIN 93, ESTIMATED RATIOS, ACTUAL TO FULL EMPLOYMENT, AND ESTIMATED FULL-TIME WEEKLY EARNINGS BY SELECTED INDUSTRIES AND STATES, AND BY SEX, 1904

INDUSTRY	State	Sex	Average weekly earnings reported in Census Bulletin 93	ESTIMATED RATIO, ACTUAL TO FULL EMPLOYMENT FOR—		Estimated full-time weekly earnings, 1904
				Month of 1904 covered in Census Bulletin 93	Year 1904 [1]	
Tobacco, cigars and cigarettes	Florida	Men	$13.56	1.007	0.817	$13.47
		Women	6.70	.972		6.89
	Pennsylvania	Men	8.61	1.007	.859	8.55
		Women	5.05	.972		5.20
Clothing, men's	New York	Men	12.30	.864	.825	14.24
		Women	6.47	.892		7.26
	Illinois	Men	13.33	.864	.825	15.43
		Women	6.73	.892		7.54
Clothing, women's	New York	Men	13.67	.931	.825	14.68
		Women	7.68	.892		8.61
	Illinois	Men	17.90	.931	.825	19.23
		Women	7.33	.892		8.22
Cotton manufactures	Massachusetts	Men	8.53	.870	.809	9.80
		Women	6.79	.870		7.80
	North Carolina	Men	5.33	.765	.713	6.97
		Women	3.82	.756		5.06
Knit goods	Pennsylvania	Men	9.35	.923	.825	10.13
		Women	5.71	.928		6.15
	New York	Men	9.06	.923	.825	9.82
		Women	7.12	.928		7.67
Shirts	New York	Men	10.08	.870	.825	11.59
		Women	6.29	.892		7.05
	Pennsylvania	Men	12.89	.870	.825	14.82
		Women	4.96	.892		5.56
Silk goods	Pennsylvania	Men	8.98	.873	.825	10.29
		Women	5.44	.855		6.36
	New Jersey	Men	10.92	.873	.825	12.51
		Women	7.30	.855		8.54
Woolen goods	Massachusetts	Men	9.40	.949	.825	9.91
		Women	7.35	1.000		7.35
	Pennsylvania	Men	9.43	.949	.825	9.94
		Women	6.65	1.000		6.65
Worsted goods	Massachusetts	Men	9.58	.901	.825	10.63
		Women	6.68	.949		7.04
	Pennsylvania	Men	9.91	.901	.825	11.00
		Women	6.43	.949		6.78
Boots and shoes	Massachusetts	Men	12.79	.870	.825	14.70
		Women	8.26	.842		9.81
	Missouri	Men	12.04	.870	.825	13.84
		Women	7.65	.842		9.09
Leather, tanned, curried, and finished.	Massachusetts	Men	9.91	.894	.825	11.09
	Pennsylvania	Men	9.51	.894	.825	10.64
Furniture	New York	Men	10.54	.795	.727	13.26
	Michigan	Men	9.78	.795	.727	12.30
Lumber and timber products	Washington	Men	13.65	.870	.840	15.69
	Louisiana	Men	9.67	.870	.795	11.11
Lumber, planing-mill products	New York	Men	12.40	.870	.727	14.25
	California	Men	14.96	.870	.845	17.20
Paper and wood pulp	New York	Men	10.28	.984	.842	10.45
	Maine	Men	11.38	.984	.842	11.57

See footnote, p. 305.

TABLE 140.—AVERAGE WEEKLY EARNINGS REPORTED FOR 1904 IN CENSUS BULLETIN 93, ESTIMATED RATIOS, ACTUAL TO FULL EMPLOYMENT, AND ESTIMATED FULL-TIME WEEKLY EARNINGS BY SELECTED INDUSTRIES AND STATES, AND BY SEX, 1904—Continued

INDUSTRY	State	Sex	Average weekly earnings reported in Census Bulletin 93	ESTIMATED RATIO, ACTUAL TO FULL EMPLOYMENT FOR—		Estimated full-time weekly earnings, 1904
				Month of 1904 covered in Census Bulletin 93	Year 1904[1]	
Printing and publishing, newspapers and periodicals.	New York	Men	$16.22	0.901	0.842	$18.00
		Women	7.25	.906		8.00
	Illinois	Men	13.37	.901	.842	14.84
		Women	5.63	.906		6.21
Printing and publishing, book and job.	New York	Men	13.38	.901	.842	14.85
		Women	7.30	.902		8.09
	Illinois	Men	14.35	.901	.842	15.93
		Women	6.58	.902		7.29
Glass	Pennsylvania	Men	14.81	.907	.907	16.33
		Women	6.15	.968		6.35
	West Virginia	Men	15.88	.890	.890	17.84
		Women	3.91	.968		4.04
Iron and steel, blast furnaces	Pennsylvania	Men	11.89	.881	.728	13.50
	Alabama	Men	9.27	.881	.734	10.52
Iron and steel, steel works and rolling mills.	Pennsylvania	Men	11.91	.856	.728	13.91
	Ohio	Men	13.81	.856	.728	16.13
Foundry and machine-shop products.	Ohio	Men	11.35	.749	.728	15.15
	New York	Men	12.13	.749	.728	16.19
Agricultural implements	Illinois	Men	11.86	.848	.728	13.99
	Indiana	Men	11.07	.848	.728	13.05
Electrical machinery, apparatus, and supplies.	New York	Men	10.48	.841	.728	12.46
		Women	5.66	.912		6.21
	Illinois	Men	11.69	.841	.728	13.90
		Women	6.80	.912		7.46
Chemicals	New Jersey	Men	10.95	.907	.907	12.07
	New York	Men	10.91	.907	.907	12.03

[1] Figures for all sex and age groups combined. See footnote to Table 135.

Chapter XV

CONVERSION OF FULL-TIME TO ACTUAL EARNINGS: THE EMPLOYMENT INDEX

The objective in this inquiry is the determination, within as narrow a margin of error as possible, of actual as contrasted with full-time earnings. In other words, the purpose is to get at the earnings which were received for the time during which the wage earner was actually employed. These "actual earnings," as the phrase is used in these pages, represent in reality the only form of wages which legitimately can be called earnings, since "full-time earnings" obviously are a kind of long-term wage rate.[1] Indeed, the term "full-time earnings," especially when used in reference to annual periods, is a distinctly metaphysical expression. Rates of pay for daily, weekly, monthly, or annual periods represent maximum sums to which the earnings actually received tend to approximate, depending more or less upon industrial conditions. For daily and weekly rates, the margins between the rates and the earnings actually received are obviously less than in the case of the longer monthly or yearly periods. It is when wage rates are expressed as hourly rates and then only that they correspond with full-time earnings for the period given. Full-time hourly earnings are, practically, identical with hourly rates.

"Actual" and "real" earnings

A caution at this point about the respective meanings of the words "actual" and "real," as used in this book, may be necessary. As explained in Chapter I the term "actual" is used to indicate money wages estimated to have been actually received as contrasted with hypothetical full-time money wages. The word "real" is used in reference to the purchasing power either of the hypothetical full-time money earnings, or of actual earnings. The expression "purchasing power of money earnings" is, however, used to a considerable extent in preference to the phrase "real earnings;" the two, however, are synonymous and are so used in these pages.

In Chapter XIII the census average wage[2] was left in a condition of almost total loss. It was found, however, that despite its use-

[1] But it should be noted again that these "hypothetical full-time (annual) earnings" will prove to be accurate measures of yearly rates only in so far as the scale of rates remains throughout the year at, or near to, the rate which was paid in the week from which the hypothetical full-time earnings estimate was derived.

[2] See initial paragraph of Ch. XIII, p. 269.

lessness for registering the amounts of full-time or actual earnings,[3] it had been uniformly so computed by the census, that the relative magnitudes of these census average items seem very faithfully to reflect the *relative* sizes of the sums that would be received under the rates prevailing if the wage earner worked regularly throughout the year; that is to say, relations between successive census averages accurately reflect changes in full-time annual earnings. The method of applying the index numbers of the census averages to the results of the special inquiry made by the Census Bureau in 1904, to obtain estimated amounts of full-time earnings, has been described in the preceding chapter. The present chapter takes up the procedure at this point and endeavors to describe the construction of a formula for converting average "full-time annual earnings" per capita into "actual annual earnings" per capita.

STATISTICS OF EMPLOYMENT AND UNEMPLOYMENT

The logical approach to the solution of the problem of deriving actual from full-time earnings centers in the utilization in some form of employment or unemployment statistics. Unfortunately, employment statistics entirely adequate to our purpose are not available; they fall short of requirements in respect to area covered and in respect to the period of time for which they have been reported. Moreover, almost invariably, they report only *changes* in employment or unemployment, revealing not at all the proportions of all wage earners who are unemployed at one time or another. Most of the reliable employment statistics run no further back than about 1914 or 1915 and even during this latter half of the period we are attempting to survey, they are extremely inadequate in that they are not reported in sufficiently detailed industrial classifications. In those few instances where they are available by separate industries, they do not run for a sufficiently long period of time. Where they do run for a sufficiently long period of time, they are not adequately classified by industries.

Despite these shortcomings of employment and unemployment statistics, an effort was made to effect a direct application of such statistics to the deflation of out full-time earnings by utilizing New York State percentages of unionists unemployed during the period 1899 to 1914; inverting these unemployment figures as to show them as employment percentages,[4] correcting the latter by the estimated margin of difference between unemployment in New York and in the United States as a whole; and, finally, splicing the resulting series

[3] The census average wage is not officially interpreted as fulfilling either of these purposes; unofficially it has, however, been so interpreted.

[4] These are, obviously, imperfect unemployment percentages, since they are based solely upon unemployment of organized wage earners.

at 1914 to a corresponding series of employment relatives from the United States Bureau of Labor Statistics for the period from 1914 to 1925. The result of this splicing of corrected New York figures to the later Federal figures gave a United States series of index numbers of employment. Employment indices were calculated by this method for each of the 41 selected industries covered in this inquiry.[5] On subjecting these indices to various tests and upon comparing them with other employment indices for the period 1914 to 1921, it was found that they were quite inadequate. They were probably fairly dependable as between the different years in the last half of the period and also as between the different years in the first half of the period. They evidently were very far from dependable in the relationship they showed between the first half of the period and the last half of the period. The splicing operation undoubtedly was the fatal feature of this procedure. It resulted in a series tilting of the index at 1914 with the result that employment appeared unduly high between 1899 and 1914 and unduly low from 1914 to 1923.

AN EMPLOYMENT INDEX BASED ON NEW JERSEY AND MASSACHUSETTS DATA

The second line of attack utilized the monthly employment figures of the States of Massachusetts and New Jersey. Both of these States have published during practically the whole of the period here surveyed, monthly reports of the number of employees on their factory pay rolls. The procedure was as follows: Index numbers of these monthly figures were computed for each month of each intercensal year from 1899 to the end of 1920. For the census years, similar monthly relatives were derived from Federal census figures for the State involved. The next step was to determine the ratio between the number employed in January of each census year and the number employed in December of the preceding census year. This margin of change was prorated between the five year-end intervals of the intercensal period. To illustrate, the Federal census returns show that in December, 1899, the average number of manufacturing wage earners employed in Massachusetts was 441,873; in January of 1904, the next census year, the corresponding number was 492,470. The ratio of the latter number to the former is 1,110. It is assumed that so far as the relations between Decembers and Januarys are concerned, that one-fifth of this increase took place in each of the five year-ends. This resulted in a ratio of 1,022 to indicate the number of employees in January 1900 as compared with the preceding month. This number as computed is 451,992. Starting now from this Jan-

[5] The series, for all industries combined, was as follows:

1899	120	1909	119	1919	111
1904	118	1914	100	1921	91

uary, the other 11 months of that intercensal year (1900) are computed by applying to the January number as a base the State series above mentioned of monthly index numbers for the intercensal years; these index numbers being also on a January base. There resulted for the intercensal years a series of numbers of employees on pay rolls on the whole considerably larger than the numbers shown by the State figures. This "stepping up" of the State data puts them on the census basis of practically complete returns from all the factories in the two States, making the monthly figures throughout, for intercensal years, strictly comparable with the monthly figures for the census year, which latter come directly from the census reports. Such consolidated series of monthly numbers employed were constructed for New Jersey, all industries combined, for Massachusetts, all industries combined; for Massachusetts with the cotton industry omitted, and for the Massachusetts cotton industry alone.

Each of these series reflects, of course, the year-to-year growth of manufacturing industries in the two States reported. The purpose of the present analysis can only be served by an employment index from which the growth factor has been eliminated; that is to say, we wish to know the year-to-year changes in employment in relation to "normal." It is necessary, therefore, to adjust the series of payroll figures, which we have just described, in such a way as to eliminate the growth factor. The least squares method was used to effect this elimination. It was done for each of the four series just mentioned as well as for a fifth series which was worked out by combining figures for Massachusetts, all industries except cotton, with the figures for New Jersey, all industries. The procedure is shown in Table 141. The figures in column H represent the percentages of actual items to the ordinates of trend for each year from 1899 to 1921, inclusive. In column I is the series of index numbers of employment derived from these percentages.

The indices derived by this method proved very much more satisfactory than those reached by splicing the data from New York State and the Federal Bureau of Labor Statistics. Comparison with other employment indices spanning the last 10 years showed, however, only a fair correspondence. Yet this index seemed, on the whole, sufficiently satisfactory to justify its use, in a limited way, in discounting full-time employment to actual employment. The series so used is the one shown in Table 141, for New Jersey combined with Massachusetts without cotton, and the series for Massachusetts, cotton alone. The combined New Jersey-Massachusetts series was originally intended for use as a general index for all industries combined and for the United States as a whole. It would probably have proven satisfactory for such a purpose and were it not for the necessity of finding some key to the employment fluctuation in separate

industries the search might easily have stopped with the derivation of this New Jersey-Massachusetts index; but it is a fact that fluctuation of employment in industry generally conceals the fluctuations in single industries, which may be anything but parallel to the fluctuation shown by the series for all industries combined. Thus, where employment generally fell precipitately in 1921, it is evident from the figures shown in earlier chapters that in a few industries there was a very slight fall and in isolated cases there were appreciable increases in employment in that period of serious depression.

TABLE 141.—DERIVATION OF AN EMPLOYMENT INDEX FOR THE UNITED STATES

[Based on pay-roll figures—Massachusetts, all industries except cotton; and New Jersey, all industries]

YEAR	Average number of wage earners in New Jersey and Massachusetts	Per cent of number on preceding census year	(y) Number of wage earners in United States, all industries—intercensal years interpolated on basis of percentages of Col. B	(x) Position of items in Col. C relative to middle ordinate	(x^2) Moments of the line of unit slope	(xy) Moments of the data in Col. C	Trend (line of least squares)	Percentage of actual items to ordinates of trend	Relatives on 1914 base
	A	B	C	D	E	F	G	H	I
1921	853,356		6,946,564	11	121	76,412,204	8,513,188	81.6	85
1920	979,098	89.1	8,104,867	10	100	81,048,670	8,345,996	97.1	104
1919	1,098,372	100.0	9,096,372	9	81	81,867,348	8,178,804	111.2	116
1918	1,052,413	121.4	8,542,004	8	64	68,336,032	8,011,612	106.6	111
1917	971,523	112.1	7,887,633	7	49	55,213,431	7,844,420	100.6	105
1916	971,591	112.1	7,887,633	6	36	47,325,798	7,677,228	102.7	107
1915	947,870	109.4	7,697,654	5	25	38,488,270	7,510,036	102.6	107
1914	866,744	100.0	7,036,247	4	16	28,144,988	7,342,844	95.8	100
1913	863,987	107.7	7,124,405	3	9	21,373,215	7,175,652	99.3	104
1912	896,044	111.7	7,389,006	2	4	14,778,012	7,008,460	105.4	110
1911	866,854	108.1	7,150,865	1	1	7,150,865	6,841,268	104.5	109
1910	855,883	106.7	7,058,254	0	0		6,674,076	100.0	96
1909	801,868	100.0	6,615,046	−1	1	−6,615,046	6,506,884	101.7	106
1908	755,194	113.4	6,201,146	−2	4	−12,402,292	6,339,692	97.8	102
1907	735,872	110.5	6,042,563	−3	9	−18,127,689	6,172,500	97.9	102
1906	700,137	105.1	5,747,271	−4	16	−22,989,084	6,005,308	95.7	100
1905	721,602	108.3	5,922,259	−5	25	−29,611,295	5,838,116	101.4	106
1904	666,095	100.0	5,468,383	−6	36	−32,810,298	5,670,924	96.4	101
1903	643,160	114.9	5,414,965	−7	49	−37,904,755	5,503,732	98.4	103
1902	635,659	113.6	5,353,699	−8	64	−42,829,592	5,336,540	100.3	105
1901	621,052	111.0	5,231,167	−9	81	−47,080,503	5,169,348	101.2	106
1900	578,733	103.4	4,872,997	−10	100	−48,729,970	5,002,156	97.4	102
1899	559,694	100.0	4,712,763	−11	121	−51,840,393	4,834,964	97.5	102
Total			153,503,763		1,012	169,197,916			

In the effort, therefore, to work out employment indexes for separate industrial groups there resulted as a by-product a third employment index for all industries combined, which is believed to be superior to either of the other two described above. For this reason this third index, now to be described, is, almost invariably, the one which has been used for deriving estimates of actual earnings.

EMPLOYMENT AND PRODUCTION

In order to arrive at a reliable series of indexes which not only could be applied as a discount to full-time earnings for all industries combined, but which would serve separately to discount earnings reported for different geographic regions and, more especially, different industrial groups, it has seemed desirable to fall back upon production figures and to derive from them the necessary series of employment indexes.

At first blush, the proposal to get the changes in employment through figures showing changes in production would seem to be a somewhat foolhardy undertaking. It is true that production and employment do, roughly speaking, vary together. Increases in employment, naturally, are accompanied by increases in production; the latter increases, however, are not exactly proportionate to changes in employment. Existing information on the subject indicates that although employment and production fluctuate—when employment increases production increases—there is a considerable difference in the respective degrees to which the two go up or down. There appears to be no doubt that the amplitude of fluctuation for production is greater, sometimes by a considerable margin, than the amplitude of fluctuation for employment. The timing of the fluctuations is very nearly, if not quite, the same. The difference in amplitude is due, in a measure, to the form in which the employment figures are reported. These figures show the number of employees on the pay roll, and consequently in a period of prosperity overtime put in by regular members of the work force is not reflected in the employment figures, and the employment curve, therefore, is not elevated. But overtime does reflect itself in increased production, and that means an elevation of the curve of production. Conversely, in periods of depression the very considerable amount of part-time employment is not reflected in the employment figures; if it were so reflected its affect undoubtedly would be to lower employment percentages and the curve representing changes in employment. Production data, on the other hand, are affected by part-time employment, inasmuch as the volume of goods produced in the abbreviated time is less than would be produced in full time, with the result that the production curve falls to lower points than the employment curve.

Consequently, it would seem that, in so far as part-time and overtime are the only disturbing elements entering into the problem, production data must represent changes in employment more accurately than do employment data. There is, however, another factor, namely, that of the efficiency of labor. It seems reasonably certain that in periods of prosperity labor is less efficient and less productive

than in periods of depression. If the per capita productivity of wage earners is less in periods of prosperity than in periods of depression, it would cast a doubt upon the adequacy of unadjusted production figures as indicators of changes in employment. For this reason it was decided to calculate for a few of the industries, where the data were available, the correlation coefficients between employment and production in those industries, and from these coefficients to work out regression equations for application to the production figures. The procedure was then by the regression method to derive indexes of employment from known indices of production. Correlation coefficients were calculated from the index numbers of employment and production shown in Table 145 for: All industries; iron and steel; metals, machinery, etc. (using for

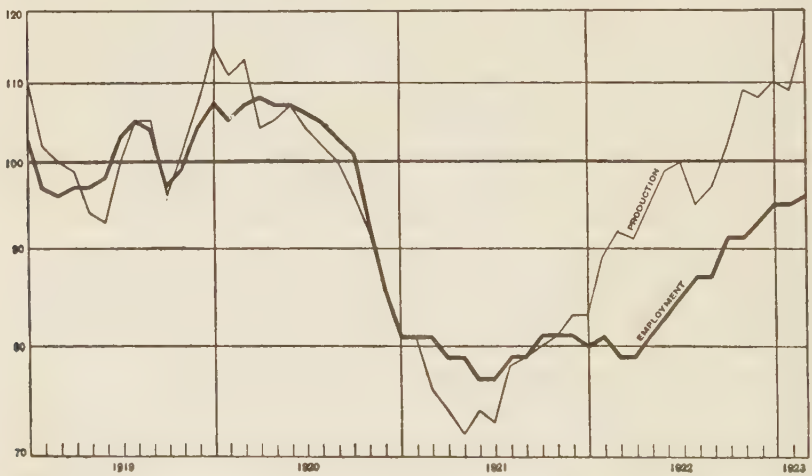

FIG. 30.—MONTHLY FLUCTUATIONS IN EMPLOYMENT AND PRODUCTION

production the index for pig iron); cotton manufactures; woolen manufactures; leather goods; and paper and printing. The index numbers given in Table 145 for all industries combined and for both employment and production, in the form of adjusted relatives with secular trend eliminated, are shown in graphic form in Figure 30.

The figures for production are from the Review of Economic Statistics for January, 1923.[6] The index numbers for employment are taken from the same journal for October, 1923.[7] In the case of the employment figures, the average for 1919 is taken as a base or 100, that year being considered a normal year.

The indexes for production are upon the base "normal equals 100." It will be seen that in the case of "all industries," at least, the base

[6] "Cyclical fluctuations of the volume of manufacture" by Edmund E. Day. Relatives for certain of the later months are from the supplement to the June, 1923, issue of that journal.

[7] "Industrial employment in the present business cycle" by W. A. Berridge.

"normal equals 100" works out exactly the same as if the base were "1919 is equal to 100," and there seems to be very little difference between "normal" and the "average for 1919" in the case of the separate industries. In making the correlations, the two sets of figures are accepted as being, to all intents and purposes, upon the same base and as being, therefore, strictly comparable. The results of these correlations are indicated in Table 142. It is evident from the correlation coefficients in the first column that there is a positive correlation and, except in the case of cotton manufactures and printing, that that correlation is very high. For "all industries" it is +0.812. The regression equations which throughout this monograph are used for derivation of employment indexes from production indexes, are given in the last column. In the case of cotton and one or two industries where the correlation is rather low, it is possible to escape the use of an employment index derived

TABLE 142.—CORRELATION COEFFICIENTS AND REGRESSION EQUATIONS

INDUSTRY	r_{xy}	Standard deviation (σ)		Regression of x (employment) on y (production)
		x	y	
All industries	+.812±.048	1.47	1.71	$x=.698y$
Iron and steel	+.853±.037	2.51	3.82	$x=.560y$
Metals, machinery, etc.[1]	+.860±.036	2.26	3.92	$x=.495y$
Cotton manufactures	+.325±.124	1.42	1.80	$x=.256y$
Woolen goods	+.854±.044	3.94	3.99	$x=.842y$
Leather goods	+.653±.084	1.87	1.81	$x=.672y$
Paper	+.681±.077	1.89	2.17	$x=.592y$
Printing	+.034±.139	.77	.85	$x=.031y$

[1] Employment indexes for metals, etc., correlated with production indexes for pig iron.

from this correlation coefficient. The alternative used is that referred to above, namely, the index for cotton in Massachusetts, derived from pay-roll figures in that industry. This index for cotton is considered to be satisfactory as an index for this industry for the country as a whole and is so used in this analysis instead of making use of a cotton index worked out by application of regression equations to production data.

The regression equation "$x=0.698y$," which is the equation for "all industries," means that for a unit change in production the change in employment will be 0.698. It is only necessary, then, to have at hand the figures showing changes in production and to know the relative amount of employment for some one year, in our period of 25 years, in order to apply the regression equation and derive the changes estimated to have taken place in employment. It is necessary to have some starting point from which to apply the regression

equation, and that starting point is taken as the year 1919. For "all industries," it is assumed that the year 1919 is normal, or 100. The employment index for that year for "all industries" is then recorded as 100. The production figures used are on the base "normal equals 100," and 1919 is accepted for all industries combined as "normal," so that the 1919 index numbers for employment and for production are both 100. From 1919 to 1920, the index number of production increases from 100 to 103. For each of these three units of change in production there is a change, as explained above, of 0.698 in employment. The derivation, therefore, of the employment index for 1920 is effected by the following formula:

$$x = .698 \qquad 3x = 2.094$$

The change in employment (x) from 1919 to 1920 is an increase of 2.094, and this increase added to 100, taken as the starting point for employment, gives the employment index 102.1 for 1920. The employment indexes for each of the other years from 1899 to 1925 are worked out in similar fashion. The process is illustrated in Table 143 for "all industries" and for woolen and worsted goods.[8] The series of index numbers in the right-hand columns represents the derived employment relatives which are used for all industries combined and for woolen and worsted goods, respectively, to discount full-time earnings to real earnings.

The production data utilized for this purpose are from the same series that is used in Table 145. For the period from 1899 to 1918, inclusive, the production data are from the September, 1920, and January, 1921, issues of the Review of Economic Statistics ("An index of the physical volume of production," by E. E. Day). The figures there given are adjusted for secular trend and are "percentages of actual items to ordinates of secular trend * * *"; this base is equivalent to a base of "normal = 100." For the years 1919 to 1923, inclusive, the figures are taken from subsequent reports published in the Review of Economic Statistics for January, 1923,[9] and various issues of the Weekly Letter of the Harvard Economic Service for 1924, 1925, and 1926.

The production index is appropriately subdivided according to industries, the arrangement being based primarily upon the census

[8] These 2 groups are taken, by way of illustration, from Table 146, which gives the details for the 41 selected industries, the 14 general groups of industries, and the 6 industrial divisions.

[9] See detailed reference to sources in footnote 3 to Table 147. After the calculations had been made on the basis of the data in Table 146, revised indices have been published which compare as follows with the indices used:

	Revised index	Index used
1919	99	100
1920	100	103
1921	75	78
1922	99	96
1923	112	110

classification into 14 general groups of industries. The production figures for the different industries and industrial groups have been paired off as exactly as possible with the 41 selected industries, the 14 industrial groups, and the 6 industrial divisions used in this book. An alignment between the industry classification used in this monograph and the classified series of production indexes is made in Table 147. It is on the basis of this allocation of the various production

TABLE 143.—ILLUSTRATION, USING FIGURES FOR ALL INDUSTRIES COMBINED AND FOR WOOLEN AND WORSTED GOODS, OF METHOD OF APPLYING REGRESSION EQUATIONS TO THE DETERMINATION OF CHANGES IN EMPLOYMENT FROM KNOWN CHANGES IN PRODUCTION: 1899–1925 [1]

YEAR	ALL INDUSTRIES				WOOLEN AND WORSTED GOODS			
	Production index: Base="normal"	Per cent of change in production from preceding year	Consequent per cent of change in employment from previous year	Estimated employment index beginning with 1919 as 1.000	Production index: Base="normal"	Per cent of change in production from preceding year	Consequent per cent of change in employment from previous year	Estimated employment index beginning with 1919 as 1.005 [2]
1899	99			1.003	81			0.912
1900	95	−4	−2.8	.975	100	+19	+16.0	1.072
1901	100	+5	+3.5	1.010	91	−9	−7.6	.996
1902	104	+4	+2.8	1.038	107	+16	+13.5	1.131
1903	101	−3	−2.1	1.017	110	+3	+2.5	1.156
1904	94	−7	−4.9	.968	100	−10	−8.4	1.072
1905	106	+12	+8.4	1.052	116	+16	+13.5	1.207
1906	109	+3	+2.1	1.073	104	−12	−10.1	1.106
1907	106	−3	−2.1	1.052	103	−1	−.9	1.097
1908	86	−20	−14.0	.912	85	−18	−15.1	.946
1909	102	+16	+11.2	1.024	114	+29	+24.4	1.190
1910	100	−2	−1.4	1.010	115	+1	+.8	1.198
1911	92	−8	−5.6	.954	86	+29	−24.4	.954
1912	102	+10	+7.0	1.024	96	+10	+8.4	1.038
1913	102			1.024	92	−4	−3.3	1.005
1914	91	−11	−7.7	.947	99	+7	+5.9	1.063
1915	96	+5	+3.5	.982	106	+7	+5.9	1.122
1916	109	+13	+9.1	1.073	144	+38	+32.0	1.442
1917	104	−5	−3.5	1.038	114	−30	−25.2	1.190
1918	101	−3	−2.1	1.017	113	−1	−.9	1.181
1919	100	−1	−.7	1.000	92	−21	−17.6	1.005
1920	103	+3	+2.1	1.021	84	−8	−6.8	.937
1921	78	−25	−17.5	.846	96	+12	+10.1	1.038
1922	96	+18	+12.6	.972	103	+7	+5.9	1.097
1923	110	+14	+9.5	1.070	112	+9	+7.6	1.173
1924	99	−10	−7.0	.993	91	−19	−16.0	.996
1925	107	+8	+5.6	1.049	87	−4	−3.4	.963

[1] Illustrative samples from Table 146.
[2] Derivations of 1919 index explained in Table 144.

series to our selected industries that the application of the regression equations is worked out in Table 146. It will be observed from this tabulation of the tie-in between the two series that it has been necessary to repeat certain of the production series for use with several of the industry groups used in this monograph. Such repetitions are pretty well confined to cognate industries, however, and are believed to fit sufficiently well for the present purpose.

Although 1919, for all industries, can be taken as normal, or 100, without serious error, it is not believed that each of the different industries and industry groups can be assumed to have been at normal, or 100, in 1919. Some of the industries were undoubtedly below normal even in this year of good business. It is, consequently, necessary to set up, so far as possible, separate 1919 starting points, or levels, for the different industry groups. It has not been found possible to work out separate starting levels for each of the selected industries; it has, however, been found to be feasible to do it for each of the six industrial divisions: Food, drink, and tobacco; lumber; metals; paper and printing; mineral products; and textiles, garments, and leather. For the groups of industries and the selected industries comprehended within the six divisions, we have used for the employment index number at the 1919 point of origin the number computed for the industrial division within which they fall.

CONSTRUCTION OF THE INDEX OF EMPLOYMENT

The method of setting up, for the various industries, the index numbers of employment at the 1919 points of origin is indicated in Table 144. The cue is taken from figures given by the National

TABLE 144.—DERIVATION OF 1919 INITIAL INDEX NUMBERS OF EMPLOYMENT FOR SIX INDUSTRIAL DIVISIONS

INDUSTRY DIVISION	PER CENT OF FULL TIME WORKED [1]		RATIO OF EACH SPECIFIED DIVISION TO AVERAGE FOR "ALL FACTORIES"		Average of 1920 and 1921 [2]
	1920	1921	1920	1921	
All industries	96.3	91.0	1.000	1.000	
Food, tobacco, and beverages	96.9	97.1	1.006	1.067	1.036
Lumber and timber products	95.1	94.8	.988	1.042	1.015
Metals, vehicles, railroad cars, and miscellaneous	96.5	87.8	1.002	.965	.984
Paper and printing	98.5	96.7	1.023	1.062	1.043
Stone, clay, glass, and chemicals [3]	98.3	95.5	1.021	1.050	1.035
Textiles, garments, and leather	94.3	93.8	.979	1.031	1.005

[1] National Bureau of Economic Research, "Employment, hours, and earnings," p. 49.
[2] These figures are assumed to indicate with sufficient accuracy the relation of each different industry to normal for the year 1919, and they are used (in Table 146) as points of departure for the regression calculations.
[3] Designated "Minerals" in National Bureau's tables.

Bureau of Economic Research in its report on *Employment, Hours, and Earnings in Prosperity and Depression*, showing the per cent of full time worked by the average factory employee while on the pay roll.[10] The bureau's figures are given by quarters for each of the six industrial divisions above referred to, and for all of these six divisions combined for each quarter of 1920 and 1921. For our purpose the quarterly figures are averaged to give annual figures for each of the

[10] Employment, Hours, and Earnings in Prosperity and Depression, p. 49.

two years, and these annual figures appear in the first two columns of Table 144. The use of these data is based on the assumption that the relation between the percentage of full time worked in any separate factory industry to the percentage of full time worked in all factory industries combined faithfully reflects the employment relation (in respect to position above or below normal) between that industrial group and all groups combined; that is to say, if, as the figures indicate for 1921, 91 per cent of full time was worked by employees in all factories combined and 97.1 of full time was worked by employees in food, drink, and tobacco factories, the conclusion is assumed to be fairly warranted that the relative level of employment in food, drink, and tobacco factories is to its level in all factories as 97.1 is to 91. This reasoning leads to a 1921 employment index of 1.067 for food, drink, and tobacco, 1.000 being the value for *all factories*. In a similar fashion an index number of 1.006 is calculated for 1920. We then use the average of the indexes for 1920 and 1921, since the National Bureau's report presents no figures for the year 1919 as the desired ratios for 1919. This procedure is made less inexcusable, in the writer's opinion, by the inclusion, with the bureau's figures for 1921, of its data for 1920. As indicated by the data of Table 144, the margin between single industrial divisions and "all factories" is less in 1920 than it is in 1921, but since the year 1919 is a year, the prosperity level of which falls between the year 1920 and 1921, it is not believed that we go far wrong in averaging the two years reported by the National Bureau and using the results as the 1919 indexes of employment. In the third and fourth columns of Table 144 then, the per cent of full time worked, all factories, is taken to be unity and corresponding per cents for the six industrial divisions calculated by dividing percentages for the industrial division by the percentage for all factories. This gives what is virtually an index number of the relationship to normal. The figures for the two years in each industry are then averaged, giving the final figures in the last column of the table. The figures at the right indicate that in three of the six industry groups, employment in 1920 and 1921 (and, we assume, in 1919) was considerably better than for all industries combined, in two of them it was about the same, and in one of them it was worse, than for all industries combined.

The procedure which we have just explained has not been resorted to without misgivings, but it has seemed to be less fallible than it would have been to have assumed that all of the different industry groups were precisely at normal in 1919 or, indeed, at any time. After all, the possible error which may result from any malpractice at this point can not be large, since the timing and amplitude of fluctuation before and following 1919 are not affected by the particular relative level assumed for a starting point in 1919.

The six coefficients, the derivation of which has just been explained, are inserted in Table 146 opposite the production index for the year 1919 and on the same line with the industrial division to which they belong. The same index is used, as above indicated, for all of the groups of industries and selected industries within any one industrial division. Thus, the 1919 point of origin index 1.036 for food, beverages, and tobacco is used for the three general industry groups: Food and kindred products, liquors and beverages, and tobacco manufactures, and for the following separate industries: Bread and other bakery products, flour and grist mill products, confectionery, slaughtering and meat packing, malt liquors, mineral and soda waters, and tobacco, cigars and cigarettes. The employment index for the 1919 point of origin being installed, the regression equation, industrially most closely related to the industry for which the employment index stands, is applied to it in the manner already described, the method being illustrated in Table 143. For example, an examination of Table 146 will show that, in the case of food, beverages, and tobacco, the 1919 production index is 106, the employment index 1.036, and the regression equation, since we have no specific correlation coefficient for any of the food industries, the equation used for all industries combined. This equation is:

$$x = .698y$$

The application of this equation to the determination of change in employment for food, beverages, and tobacco is made by substituting in the equation the production value for y; that is to say, the percentage of change in production from 1919 to 1920 which, in this case, is -3. The equation then reads—

$$x = 0.698 \times 3$$

or

$$x = 2.094$$

This value of x represents the percentage change in employment from 1919 to 1920 and is, therefore, to be subtracted from the 1919 point of origin figure 1.036. The latter figure read as a percentage is 103.6. The difference between the two numbers is 101.5, which is the derived employment index (printed in Table 146 as a ratio, 1.015) for food, beverages, and tobacco for 1920. The process is continued, in this way using each successive year as a base for applying the regression equation to the change in production and adding the discounted change to the last year computed. By way of illustration of the method used, the figures for "all industries" and for woolen goods are given in Table 143 above. The complete series of employment indexes derived by the foregoing method is shown for all of the industrial groups and for each year from 1899

to 1925 in Table 146. The particular regression equations utilized in working out the employment indices for the different industrial groups are briefly indicated in the following summary:

Cotton goods	$x=.256y$
Woolen goods	$x=.842y$
Leather and its finished products (and the two selected industries included in this group)	$x=.672y$
Paper and printing (and the three selected industries included within this group)	$x=.592y$
Metals, vehicles, railroad cars, and miscellaneous	$x=.560y$
Iron and steel and their products	$x=.560y$
Iron and steel, blast furnaces	$x=.560y$
Iron and steel, steel works and rolling mills, etc	$x=.560y$
Foundry and machine-shop products	$x=.495y$
Metals and metal products, other than iron and steel (including the two selected industries in this group)	$x=.560y$
Vehicles for land transportation (including the three selected industries within this group)	$x=.560y$
Railroad repair shops (including the two selected industries within this group)	$x=.560y$
For all other industrial divisions, groups, and selected industries	$x=.698y$

The index numbers of employment derived from the corresponding index numbers of production, shown in Table 146, are calculated by application of the regression on equations to the degree of change in production, using in each case the available regression equation which most nearly fits the particular industry. The base in every case is taken as, normal equals 100. For the period 1899 to 1918 the production index numbers are described as "percentages of actual items to ordinates of secular trend * * * ." The employment indexes are then computed from the production figures by multiplying the regression coefficient by the year to year ratios of change in production.

The year 1919 is the starting point for application of regression equations. Employment, all industries combined, is taken as normal for that year and gives the index 1.00; the six industry groups and the subordinate industrial classifications are given coefficients as indicated in the last column. These coefficients are taken from Table 142.

The employment indices for the different industry groups and for each census year from 1899 to 1925, derived by the method here described, are assembled in somewhat more compact form in Table 156.

The construction of regional series of employment indices was made by following, essentially, the same procedure which we have explained for the industrial groups. The index which is given above for "all industries" is, of course, the proper index to use for the

United States as a whole. Regional subdivision of the United States is not attempted further than to use separate indexes for the Northeast region, the South and the West. The Northeast region contains the New England, Middle Atlantic, East North Central, and West North Central geographic divisions. The Southern region includes the South Atlantic, East South Central, and West South Central. The West includes the Mountain and Pacific divisions. For the Northeast the employment index is not based on regression figures at all, but on a series drawn from a combination of employment data from Massachusetts, New York, and Wisconsin. For the South and West no separate employment indices are calculated. The fractions of full employment for those two regions are derived not from employment indexes but from estimated fractions of full employment for the United States as a whole.[11]

The method of deriving, from the employment index, showing simply relative changes in employment, estimates of the absolute amount of employment ("fractions of full employment") at different periods, is reserved for discussion in the next chapter.

TABLE 145.—INDEX NUMBERS OF EMPLOYMENT AND PRODUCTION[1]

[Average for 1919=100. P.=Production; E.=Employment]

YEAR AND MONTH	ALL INDUSTRIES		IRON AND STEEL		METALS, ETC.	PIG IRON	COTTON MANUFACTURES		WOOLEN MANUFACTURES		LEATHER		PAPER		PRINTING	
	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.
1919																
January	103	110	118	132	104	131	92	108	87	81	90	105	100	96	98	90
February	97	102	112	120	103	123	90	92	52	61	92	100	100	94	100	92
March	96	100	108	108	101	116	90	82	64	62	93	88	99	88	99	91
April	97	99	105	98	99	95	92	93	88	85	97	111	97	91	102	96
May	97	94	100	80	96	78	103	93	98	88	101	103	91	93	102	96
June	98	93	100	91	92	84	103	94	114	97	102	102	97	95	103	102
July	103	100	103	104	96	97	104	103	119	120	102	101	98	104	104	104
August	105	105	105	112	101	108	105	104	120	105	103	102	99	104	105	107
September	104	105	106	98	100	99	106	106	117	119	107	102	104	105	104	106
October	97	96	70	65	100	69	106	112	118	122	106	96	104	108	88	106
November	99	101	81	87	101	94	104	105	116	121	106	95	106	108	99	108
December	104	107	98	102	104	102	108	109	114	140	103	94	105	116	105	101
1920																
January	107	115	110	120	106	119	108	113	121	148	105	96	108	128	109	102
February	105	111	112	122	106	122	106	107	120	132	103	98	108	119	107	105
March	107	113	113	124	110	126	108	109	120	127	103	99	114	123	107	100
April	108	104	115	108	110	103	108	110	120	126	104	95	115	123	108	97
May	107	105	106	114	108	110	106	102	118	99	104	97	115	121	108	98
June	107	107	112	122	108	118	107	109	111	77	100	98	114	122	108	98
July	106	104	111	120	108	119	108	104	51	69	98	90	116	123	109	100
August	105	102	108	122	108	120	107	100	50	68	92	76	118	115	109	101
September	103	100	111	121	104	121	106	98	64	68	87	80	117	116	109	102
October	101	96	110	116	104	121	102	79	67	65	82	67	117	105	109	104
November	93	92	107	105	97	111	97	72	58	65	74	72	113	95	108	100
December	86	86	98	100	88	101	93	64	47	66	66	71	107	90	104	101

[11] Employment indexes and fractions of full employment for different regions are given in Table 153.

See footnotes on p.-321.

TABLE 145.—INDEX NUMBERS OF EMPLOYMENT AND PRODUCTION[1]—Contd.

[Average for 1919=100. P.=Production; E.=Employment]

YEAR AND MONTH	ALL INDUSTRIES		IRON AND STEEL		METALS, ETC.	PIG IRON	COTTON MANUFACTURES		WOOLEN MANUFACTURES		LEATHER		PAPER		PRINTING	
	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.
1921																
January	81	81	81	89	80	92	88	66	49	66	64	59	102	82	101	94
February	81	81	81	75	77	80	105	81	70	83	66	69	100	87	99	94
March	81	76	77	51	73	54	102	80	79	96	69	71	97	82	97	95
April	79	74	72	47	70	43	102	77	96	108	65	74	88	80	96	92
May	79	72	69	45	67	42	104	80	101	104	69	75	76	69	91	95
June	77	74	66	42	62	42	103	88	103	110	75	82	75	72	92	97
July	77	73	57	37	60	35	104	80	104	109	74	84	74	66	92	97
August	79	78	58	41	61	36	106	98	105	117	75	92	75	74	92	95
September	79	79	59	41	61	38	108	103	104	116	76	90	77	83	93	97
October	81	80	62	47	65	43	109	98	104	110	78	88	78	87	95	98
November	81	81	65	53	64	53	108	108	101	120	80	102	84	96	96	97
December	81	83	65	59	64	61	107	106	100	130	81	103	82	98	95	101
1922																
January	80	83	61	61	63	62	108	96	96	116	82	104	83	95	95	100
February	81	89	67	67	66	68	106	96	98	114	85	108	86	102	95	100
March	79	92	68	73	67	70	76	94	----	----	82	102	86	107	95	101
April	79	91	75	85	69	74	75	82	----	----	84	95	82	97	97	107
May	81	95	76	91	72	80	76	90	----	----	83	88	86	104	96	106
June	83	99	80	94	74	88	77	96	----	----	84	82	86	103	97	106
July	85	100	81	95	73	90	76	90	----	----	84	87	87	97	96	107
August	87	95	78	75	77	67	80	106	----	----	87	97	87	105	96	108
September	87	97	76	81	78	75	86	105	----	----	90	93	88	106	96	113
October	91	102	80	94	85	92	88	104	----	----	90	96	91	102	98	114
November	91	109	81	100	86	102	96	118	----	----	91	109	92	111	98	112
December	93	[2]108	84	108	88	111	100	119	----	----	----	----	91	113	99	109
1923																
January	95	[2]110	86	[2]120	89	[2]116	102	[2]112	----	----	----	----	----	----	100	[2]109
February	95	[2]109	89	[2]114	91	[2]114	106	[2]112	----	----	----	----	----	----	100	[2]106
March	96	[2]117	89	[2]118	93	[2]120	107	[2]114	----	----	----	----	----	----	99	[2]111
April	----	----	92	[2]127	95	[2]124	107	[2]108	----	----	----	----	----	----	101	[2]114
May	----	----	93	[2]133	95	[2]133	----	----	----	----	----	----	----	----	----	----

[1] Employment figures are from p. 298, October, 1923, Review of Economic Statistics; and production figures are taken from pp. 34–55 of the January, 1923, number.

[2] Review of Economic Statistics, supplement, June, 1923, pp. 163–165.

TABLE 146.—INDEX NUMBERS OF THE PHYSICAL VOLUME OF PRODUCTION AND UNITED STATES, BY INDUSTRIAL DIVISIONS, INDUSTRY GROUPS,

[Base: "Normal"=100. P.=Production; E.=Employment]

	INDUSTRY CLASSIFICATION	1925		1924		1923		1922		1921	
		P.	E.	P.	E.	P.	E.	P.	E.	P.	E.
1	All manufacturing industries	107	1.049	99	0.993	110	1.070	96	0.972	78	0.846
2	Food, beverages, and tobacco	102	1.006	104	1.020	106	1.034	104	1.021	96	.966
3	Food and kindred products	102	.973	108	1.015	106	1.001	108	1.015	96	.931
4	Bread and other bakery products	99	.945	106	.994	103	.973	102	.966	100	.952
5	Flour-mill and gristmill products	99	.945	106	.994	103	.973	102	.966	100	.952
6	Confectionery	111	1.050	104	1.001	101	.980	130	1.182	96	.945
7	Slaughtering and meat packing	100	.963	112	1.043	112	1.043	99	.952	90	.889
8	Liquors and beverages	107	1.017	99	1.031	110	1.108	96	1.011	78	.881
9	Liquors, malt	107	1.017	99	1.031	110	1.108	96	1.011	78	.881
10	Mineral and soda waters	107	1.017	99	1.031	110	1.108	96	1.011	78	.881
11	Tobacco manufactures	[1]103	1.056	100	1.035	101	1.042	101	1.042	97	1.015
12	Tobacco, cigars and cigarettes	[1]103	1.056	100	1.035	101	1.042	101	1.042	97	1.015
13	Textiles, garments, and leather	89	.948	86	.927	107	1.074	100	1.026	91	.963
14	Textiles and their products	89	.948	86	.927	107	1.074	100	1.026	91	.963
15	Carpets and rugs	[2]104	1.053	95	.990	107	1.074	100	1.026	91	.963
16	Shirts	94	.983	87	.934	107	1.074	100	1.026	91	.963
17	Clothing, men's	94	.983	87	.934	107	1.074	100	1.026	91	.963
18	Clothing, women's	94	.983	87	.934	107	1.074	100	1.026	91	.963
19	Cotton goods	[2] 99	1.002	85	.967	105	1.017	99	1.002	89	.976
20	Dyeing and finishing textiles	94	.988	87	.934	107	1.074	100	1.026	91	.963
21	Knit goods	94	.983	87	.934	107	1.074	100	1.002	91	.963
22	Silk goods	94	.983	87	.934	107	1.074	100	1.002	91	.963
23	Woolen and worsted goods	[2] 87	.963	91	.996	112	1.173	103	1.097	96	1.038
24	Leather and its finished products	[2] 82	.880	81	.872	118	1.121	98	.987	84	.890
25	Boots and shoes	90	.937	89	.930	101	1.011	97	.984	85	.904
26	Leather, tanned, curried, and finished	[2] 82	.877	81	.870	134	1.226	99	.991	83	.884
27	Paper and printing [3]	[2]105	1.173	103	1.161	114	1.226	107	1.072	90	.971
28	Paper and printing [3]	[2]105	1.173	103	1.161	114	1.226	107	1.072	90	.971
29	Paper and wood pulp [3]	[2]102	1.054	101	1.048	115	1.131	104	1.066	81	.930
30	Printing and publishing, book and job [3]	[2]107	1.066	104	1.049	113	1.102	110	1.084	99	1.018
31	Printing and publishing, newspapers [3]	[2]107	1.066	104	1.049	113	1.102	110	1.084	99	1.013
32	Stone, clay, glass, and chemicals	107	1.083	99	1.027	110	1.104	96	1.007	78	.881
33	Chemicals and allied products	107	1.083	99	1.027	110	1.104	96	1.007	78	.881
34	Chemicals	107	1.083	99	1.027	110	1.104	96	1.007	78	.881
35	Petroleum refining	107	1.083	99	1.027	110	1.104	96	1.007	78	.881
36	Stone, clay, and glass products	107	1.083	99	1.027	110	1.104	96	1.007	78	.881
37	Brick and tile, terra-cotta, and fire-clay	107	1.083	99	1.027	110	1.104	96	1.007	78	.881
38	Glass	107	1.083	99	1.027	110	1.104	96	1.007	78	.881
39	Metals, vehicles, railroad cars, and miscellaneous.	104	1.017	90	.939	114	1.073	84	.905	51	.720
40	Iron and steel and their products	104	1.017	90	.939	114	1.073	84	.905	51	.720
41	Iron and steel, blast furnaces	104	1.017	90	.939	114	1.073	84	.905	51	.720
42	Iron and steel, steel works and rolling mills.	104	1.017	90	.939	114	1.073	84	.905	51	.720
43	Foundry and machine-shop products	104	1.014	90	.944	114	1.063	84	.914	51	.751
44	Metals and metal products, other than iron and steel.	104	1.017	90	.939	114	1.073	84	.905	51	.720
45	Smelting and refining, copper, lead, and zinc.	104	1.017	90	.939	114	1.073	84	.905	51	.720
46	Vehicles for land transportation	117	1.090	95	.967	114	1.073	84	.905	51	.720
47	Automobile bodies and parts	119	1.101	109	1.045	114	1.073	84	.905	51	.720
48	Automobiles	119	1.101	109	1.045	114	1.073	84	.905	51	.720
49	Cars, steam-railroad	104	1.017	90	.939	114	1.073	84	.905	51	.720
50	Railroad repair shops	104	1.017	90	.939	114	1.073	84	.905	51	.720
51	Railroad repair shops—electric	104	1.017	90	.939	114	1.073	84	.905	51	.720
52	Railroad repair shops—steam	104	1.017	90	.939	114	1.073	84	.905	51	.720
53	Miscellaneous	107	1.031	99	.976	110	1.053	96	.956	78	.830
54	Agricultural implements	107	1.031	99	.976	110	1.053	96	.956	78	.830
55	Rubber tires, tubes, and other rubber goods.	107	1.031	99	.976	110	1.053	96	.956	78	.830
56	Shipbuilding, steel	107	1.031	99	.976	110	1.053	96	.956	78	.830
57	Electrical machinery, apparatus, and supplies.	107	1.031	99	.976	110	1.053	96	.956	78	.830
58	Lumber and timber products	129	1.209	122	1.161	121	1.154	115	1.112	89	.931
59	Lumber and timber products	129	1.209	122	1.161	121	1.154	115	1.112	89	.931
60	Furniture	129	1.209	122	1.161	121	1.154	115	1.112	89	.931
61	Lumber, timber products	129	1.209	122	1.161	121	1.154	115	1.112	89	.931
62	Lumber, planing-mill products	129	1.209	122	1.161	121	1.154	115	1.112	89	.931

[1] Based on average of 10 months; data for June and December not available.
[2] Based on average of first 11 months.
[3] Index numbers of production for 1923 are based upon the first 5 months of the year.

CORRESPONDING INDEXES OF EMPLOYMENT DERIVED THEREFROM, FOR THE AND SELECTED INDUSTRIES, EACH YEAR: 1899–1925

[Base: "Normal"=100. P.=Production; E.=Employment]

1926		1919		1918		1917		1916		1915		1914		1913		1912		
P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	
103	1.021	100	1.000	101	1.017	104	1.038	109	1.073	96	0.982	91	0.947	102	1.024	102	1.024	1
103	1.015	106	1.036	93	.945	95	.959	92	.938	93	.945	97	.973	99	.987	98	.980	2
96	.931	111	1.036	113	1.049	96	.938	93	.917	103	.987	95	.931	96	.938	98	.952	3
99	.945	112	1.036	101	.959	72	.757	62	.687	112	1.036	101	.959	96	.924	100	.952	4
99	.945	112	1.036	101	.959	72	.757	62	.687	112	1.036	101	.959	96	.924	100	.952	5
107	1.022	109	1.036	91	.910	105	1.008	107	1.022	106	1.015	105	1.008	101	.980	100	.973	6
96	.931	111	1.036	113	1.049	97	.938	102	.973	88	.875	89	.882	97	.938	99	.952	7
103	1.056	100	1.036	76	.868	111	1.112	105	1.071	78	.882	96	1.008	101	1.043	99	1.029	8
103	1.056	100	1.036	66	.798	82	.910	81	.903	85	.931	97	1.014	98	1.021	96	1.008	9
103	1.056	100	1.036	76	.868	111	1.112	105	1.071	78	.832	96	1.008	101	1.043	99	1.029	10
112	1.119	100	1.036	98	1.022	103	1.057	97	1.015	91	.973	98	1.022	103	1.057	99	1.029	11
112	1.119	100	1.036	98	1.022	103	1.057	97	1.015	91	.973	98	1.022	103	1.057	99	1.029	12
93	.977	97	1.005	120	1.165	122	1.179	129	1.228	106	1.067	102	1.039	104	1.053	100	1.025	13
93	.977	97	1.005	120	1.165	122	1.179	129	1.228	106	1.067	102	1.039	104	1.053	100	1.025	14
93	.977	97	1.005	120	1.165	122	1.179	129	1.228	106	1.067	102	1.039	104	1.053	100	1.025	15
93	.977	97	1.005	120	1.165	122	1.179	129	1.228	106	1.067	102	1.039	104	1.053	100	1.025	16
93	.977	97	1.005	120	1.165	122	1.179	129	1.228	106	1.067	102	1.039	104	1.053	100	1.025	17
93	.977	97	1.005	120	1.165	122	1.179	129	1.228	106	1.067	102	1.039	104	1.053	100	1.025	18
97	.997	100	1.005	122	1.061	128	1.076	124	1.066	105	1.017	105	1.017	107	1.022	101	1.007	19
93	.977	97	1.005	120	1.165	122	1.179	129	1.228	106	1.067	102	1.039	104	1.053	100	1.025	20
93	.997	97	1.005	120	1.165	122	1.179	129	1.228	106	1.067	102	1.039	104	1.053	100	1.025	21
93	.997	97	1.005	120	1.165	122	1.179	129	1.228	106	1.067	102	1.039	104	1.053	100	1.025	22
84	.937	92	1.005	113	1.181	114	1.190	144	1.442	106	1.122	99	1.063	92	1.005	96	1.038	23
86	.904	101	1.005	101	1.005	104	1.025	109	1.058	96	.971	91	.937	102	1.011	102	1.011	24
94	.964	100	1.005	101	1.011	104	1.031	109	1.065	96	.978	91	.944	102	1.018	102	1.018	25
87	.911	101	1.005	101	1.005	104	1.025	109	1.058	96	.971	91	.937	102	1.011	102	1.011	26
110	1.090	102	1.043	101	1.037	104	1.054	109	1.084	96	1.007	91	.977	102	1.043	102	1.043	27
110	1.090	102	1.043	101	1.037	104	1.054	109	1.084	96	1.007	91	.977	102	1.043	102	1.043	28
115	1.131	100	1.043	101	1.048	104	1.066	109	1.096	96	1.019	91	.981	102	1.055	102	1.055	29
104	1.048	103	1.043	101	1.031	104	1.048	109	1.078	96	1.001	91	.971	102	1.037	102	1.037	30
104	1.048	103	1.043	101	1.031	104	1.048	109	1.078	96	1.001	91	.971	102	1.037	102	1.037	31
103	1.055	100	1.035	102	1.048	100	1.035	104	1.062	93	.986	92	.979	99	1.028	100	1.035	32
103	1.055	100	1.035	124	1.202	107	1.083	108	1.090	95	1.000	97	1.014	100	1.035	101	1.041	33
103	1.055	100	1.035	124	1.202	107	1.083	108	1.090	95	1.000	97	1.014	100	1.035	101	1.041	34
103	1.055	100	1.035	112	1.118	110	1.104	104	1.063	102	1.049	102	1.049	101	1.042	96	1.007	35
103	1.055	100	1.035	80	.895	93	.986	100	1.035	91	.972	86	.937	98	1.021	98	1.021	36
103	1.055	100	1.035	94	.993	102	1.049	100	1.035	84	.921	81	.902	101	1.042	101	1.042	37
103	1.055	100	1.035	109	1.097	101	1.042	109	1.097	106	1.076	96	1.007	111	1.111	95	1.000	38
114	1.073	98	.984	103	1.012	120	1.107	130	1.163	100	.995	88	.928	111	1.056	110	1.051	39
114	1.073	98	.984	110	1.051	112	1.062	118	1.096	94	.961	76	.860	104	1.017	104	1.017	40
114	1.073	98	.984	110	1.051	112	1.062	118	1.096	94	.961	76	.860	104	1.017	104	1.017	41
114	1.073	98	.984	110	1.051	112	1.062	118	1.096	94	.961	76	.860	104	1.017	104	1.017	42
114	1.063	98	.984	110	1.043	112	1.053	118	1.083	94	.964	76	.875	104	1.013	104	1.013	43
114	1.073	98	.984	131	1.168	124	1.129	134	1.185	110	1.051	91	.944	100	.995	104	1.017	44
114	1.073	98	.984	131	1.168	124	1.129	134	1.185	110	1.051	91	.944	100	.995	104	1.017	45
114	1.073	98	.984	63	.788	125	1.135	138	1.208	100	.995	99	.989	129	1.157	126	1.140	46
114	1.073	98	.984	103	1.012	137	1.202	153	1.292	147	1.248	101	1.000	126	1.140	153	1.292	47
114	1.073	98	.984	103	1.012	137	1.202	153	1.292	147	1.248	101	1.000	126	1.140	153	1.292	48
114	1.073	98	.984	54	.737	70	.827	66	.804	48	.704	78	.872	101	1.000	91	.944	49
114	1.073	98	.984	103	1.012	120	1.107	130	1.163	100	.995	88	.928	111	1.056	110	1.051	50
114	1.073	98	.984	103	1.012	120	1.107	130	1.163	100	.995	88	.928	111	1.056	110	1.051	51
114	1.073	98	.984	103	1.012	120	1.107	130	1.163	100	.995	88	.928	111	1.056	110	1.051	52
103	1.004	100	.984	103	1.004	120	1.123	130	1.194	100	.984	88	.901	111	1.061	110	1.054	53
103	1.004	100	.984	103	1.004	120	1.123	130	1.194	100	.984	88	.901	111	1.061	110	1.054	54
103	1.004	100	.984	103	1.004	120	1.123	130	1.194	100	.984	88	.901	111	1.061	110	1.054	55
103	1.004	100	.984	103	1.004	120	1.123	130	1.194	100	.984	88	.901	111	1.061	110	1.054	56
103	1.004	100	.984	103	1.004	120	1.123	130	1.194	100	.984	88	.901	111	1.061	110	1.054	57
97	.987	101	1.015	72	.812	81	.875	90	.938	86	.910	92	.952	100	1.007	102	1.021	58
97	.987	101	1.015	72	.812	81	.875	90	.938	86	.910	92	.952	100	1.007	102	1.021	59
97	.987	101	1.015	72	.812	81	.875	90	.938	86	.910	92	.952	100	1.007	102	1.021	60
97	.987	101	1.015	72	.812	81	.875	90	.938	86	.910	92	.952	100	1.007	102	1.021	61
97	.987	101	1.015	72	.812	81	.875	90	.938	86	.910	92	.952	100	1.007	102	1.021	62

TABLE 146.—INDEX NUMBERS OF THE PHYSICAL VOLUME OF PRODUCTION AND UNITED STATES, BY INDUSTRIAL DIVISIONS, INDUSTRY GROUPS,

[Base: "Normal"=100. P.=Production; E.=Employment]

	INDUSTRY CLASSIFICATION	1911		1910		1909		1908		1907	
		P.	E.	P.	E.	P.	E.	P.	E.	P.	E.
1	All manufacturing industries	92	0.954	100	1.010	102	1.024	86	0.912	106	1.052
2	Food, beverages, and tobacco	99	.987	98	.980	99	.987	100	.994	101	1.001
3	Food and kindred products	96	.938	95	.931	105	1.001	102	.970	100	.956
4	Bread and other bakery products	90	.882	98	.938	113	1.043	93	.973	88	.938
5	Flour-mill and gristmill products	90	.882	98	.938	113	1.043	93	.973	88	.938
6	Confectionery	95	.938	101	.980	102	.987	95	.938	106	1.014
7	Slaughtering and meat packing	102	.973	94	.917	96	.931	103	.979	102	.973
8	Liquors and beverages	103	1.057	97	1.015	90	.966	93	.987	111	1.113
9	Liquors, malt	101	1.042	98	1.022	96	1.008	104	1.063	108	1.091
10	Mineral and soda waters	103	1.057	97	1.015	90	.966	93	.987	111	1.113
11	Tobacco manufactures	99	1.057	100	1.036	98	1.022	96	1.009	103	1.057
12	Tobacco, cigars and cigarettes	99	1.029	100	1.036	98	1.022	96	1.009	103	1.057
13	Textiles, garments, and leather	90	.956	100	1.025	107	1.073	90	.955	102	1.038
14	Textiles and their products	90	.956	100	1.025	107	1.073	90	.955	102	1.038
15	Carpets and rugs	90	.956	100	1.025	107	1.073	90	.955	102	1.038
16	Shirts	90	.956	100	1.025	107	1.073	90	.955	102	1.038
17	Clothing, men's	90	.956	100	1.025	107	1.073	90	.955	102	1.038
18	Clothing, women's	90	.956	100	1.025	107	1.073	90	.955	102	1.038
19	Cotton goods	90	.979	94	.989	105	1.017	93	.987	107	1.022
20	Dyeing and finishing textiles	90	.956	100	1.025	107	1.073	90	.955	102	1.038
21	Knit goods	90	.956	100	1.025	107	1.073	90	.955	102	1.038
22	Silk goods	90	.956	100	1.025	107	1.073	90	.955	102	1.038
23	Woolen and worsted goods	86	.954	115	1.198	114	1.190	85	.946	103	1.097
24	Leather and its finished products	92	.944	100	.998	102	1.011	86	.904	106	1.038
25	Boots and shoes	92	.951	100	1.005	102	1.018	86	.910	106	1.044
26	Leather, tanned, curried, and finished	92	.944	100	.998	102	1.011	86	.904	106	1.038
27	Paper and printing [1]	92	.983	100	1.031	102	1.043	86	.948	106	1.066
28	Paper and printing [1]	92	.983	100	1.031	102	1.043	86	.948	106	1.066
29	Paper and wood pulp [1]	92	.995	100	1.043	102	1.055	86	.960	106	1.078
30	Printing and publishing, book and job [1]	92	.977	100	1.025	102	1.037	86	.942	106	1.060
31	Printing and publishing, newspapers [1]	92	.977	100	1.025	102	1.037	86	.942	106	1.060
32	Stone, clay, glass, and chemicals	95	1.000	97	1.014	102	1.048	92	.979	105	1.069
33	Chemicals and allied products	93	.986	90	.965	99	1.028	96	1.007	106	1.076
34	Chemicals	93	.986	90	.965	99	1.028	96	1.007	106	1.076
35	Petroleum refining	102	1.049	103	1.056	98	1.020	103	1.056	105	1.069
36	Stone, clay, and glass products	96	1.007	104	1.063	104	1.063	87	.944	104	1.063
37	Brick and tile, terra-cotta, and fire-clay	91	.972	104	1.063	99	1.028	83	.916	112	1.119
38	Glass	105	1.069	105	1.069	84	.923	88	.951	102	1.049
39	Metals, vehicles, railroad cars, and miscellaneous.	92	.950	112	1.062	103	1.012	82	.894	118	1.096
40	Iron and steel and their products	87	.922	105	1.023	103	1.012	67	.810	115	1.079
41	Iron and steel, blast furnaces	87	.922	105	1.023	103	1.012	67	.810	115	1.079
42	Iron and steel, steel works and rolling mills.	87	.922	105	1.023	103	1.012	67	.810	115	1.079
43	Foundry and machine-shop products	87	.929	105	1.018	103	1.008	67	.830	115	1.068
44	Metals and metal products, other than iron and steel.	97	.978	99	.989	103	1.012	85	.911	95	.967
45	Smelting and refining, copper, lead, and zinc.	97	.978	99	.989	103	1.012	85	.911	95	.967
46	Vehicles for land transportation	88	.928	129	1.157	104	1.017	95	.967	145	1.247
47	Automobile bodies and parts	114	1.073	117	1.090	106	1.028	102	1.006	99	.989
48	Automobiles	114	1.073	117	1.090	106	1.028	102	1.006	99	.989
49	Cars, steam-railroad	73	.844	125	1.135	75	.855	52	.726	192	1.510
50	Railroad repairs shops	92	.950	112	1.062	103	1.012	82	.894	118	1.096
51	Railroad repair shops—electric	92	.950	112	1.062	103	1.012	82	.894	118	1.096
52	Railroad repair shops—steam	92	.950	112	1.062	103	1.012	82	.894	118	1.096
53	Miscellaneous	92	.929	112	1.068	103	1.004	82	.859	118	1.110
54	Agricultural implements	92	.929	112	1.068	103	1.004	82	.859	118	1.110
55	Rubber tires, tubes, and other rubber goods.	92	.929	112	1.068	103	1.004	82	.859	118	1.110
56	Shipbuilding, steel	92	.929	112	1.068	103	1.004	82	.859	118	1.110
57	Electrical machinery, apparatus, and supplies.	92	.929	112	1.068	103	1.004	82	.859	118	1.110
58	Lumber and timber products	97	.986	101	1.015	101	1.015	95	.973	104	1.035
59	Lumber and timber products	97	.986	101	1.015	101	1.015	95	.973	104	1.035
60	Furniture	97	.986	101	1.015	101	1.015	95	.973	104	1.035
61	Lumber, timber products	97	.986	101	1.015	101	1.015	95	.973	104	1.035
62	Lumber, planing-mill products	97	.986	101	1.015	101	1.015	95	.973	104	1.035

[1] Index numbers of production for 1923 are based upon the first 5 months of the year.

CORRESPONDING INDEXES OF EMPLOYMENT DERIVED THEREFROM, FOR THE AND SELECTED INDUSTRIES, EACH YEAR: 1899–1925—Continued

[Base: "Normal"=100. P_t=Production; E_t=Employmen

1906		1905		1904		1903		1902		1901		1900		1899		Regression equation used	
P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.	P.	E.		
109	1.073	106	1.052	94	0.968	101	1.017	104	1.038	100	1.010	95	0.975	99	1.003	$x=.698y$	1
106	1.036	103	1.015	100	.994	103	1.015	100	.994	100	.994	95	.959	95	.959	$x=.698y$	2
109	1.019	111	1.032	100	.956	102	.970	99	.949	106	1.007	90	.886	91	.893	$x=.698y$	3
117	1.140	124	1.189	101	1.029	101	1.029	101	1.029	110	1.091	81	.889	87	.931	$x=.698y$	4
117	1.140	124	1.189	101	1.029	101	1.029	101	1.029	110	1.091	81	.889	87	.931	$x=.698y$	5
101	.980	98	.959	96	.945	112	1.056	92	.917	108	1.028	92	.917	99	.966	$x=.698y$	6
106	1.000	106	1.000	100	.959	102	.973	102	.973	101	.966	95	.924	93	910	$x=.698y$	7
103	1.057	102	1.050	100	1.036	105	1.071	102	1.050	100	1.036	96	1.008	93	.987	$x=.698y$	8
105	1.070	98	1.022	100	1.036	101	1.042	101	1.042	96	1.008	98	1.021	96	1.008	$x=.698y$	9
103	1.057	102	1.050	100	1.036	105	1.071	102	1.050	100	1.036	96	1.008	93	.987	$x=.698y$	10
104	1.065	99	1.029	100	1.036	104	1.065	100	1.036	98	1.022	98	1.022	99	1.029	$x=.698y$	11
104	1.065	99	1.029	100	1.036	104	1.065	100	1.036	98	1.022	98	1.022	99	1.029	$x=.698y$	12
104	1.052	107	1.072	99	1.017	103	1.045	105	1.058	95	.989	96	.996	101	1.030	$x=.698y$	13
104	1.052	107	1.072	99	1.017	103	1.045	105	1.058	95	.989	96	.996	101	1.030	$x=.698y$	14
104	1.052	107	1.072	99	1.017	103	1.045	105	1.058	95	.989	96	.996	101	1.030	$x=.698y$	15
104	1.052	107	1.072	99	1.017	103	1.045	105	1.058	95	.989	96	.996	101	1.030	$x=.698y$	16
104	1.052	107	1.072	99	1.017	103	1.045	105	1.058	95	.989	96	.996	101	1.030	$x=.698y$	17
104	1.052	107	1.072	99	1.017	103	1.045	105	1.058	95	.989	96	.996	101	1.030	$x=.698y$	18
108	1.025	103	1.012	93	.987	102	1.010	102	1.010	94	.989	99	1.002	103	1.012	$x=.256y$	19
104	1.052	107	1.072	99	1.017	103	1.045	105	1.048	95	.989	96	.996	101	1.030	$x=.698y$	20
104	1.052	107	1.072	99	1.017	103	1.045	105	1.058	95	.989	96	.996	101	1.030	$x=.698y$	21
104	1.052	107	1.072	99	1.017	103	1.045	105	1.058	95	.989	96	.996	101	1.030	$x=.698y$	22
104	1.106	116	1.207	100	1.072	110	1.156	107	1.131	91	.996	100	1.072	81	.912	$x=.842y$	23
109	1.058	106	1.038	94	.957	101	1.005	104	1.025	100	.998	95	.964	99	.998	$x=.672y$	24
109	1.065	106	1.044	94	.964	101	1.011	104	1.031	100	1.005	95	.971	99	.998	$x=.672y$	25
109	1.058	106	1.038	94	.957	101	1.005	104	1.025	100	.998	95	.964	99	.991	$x=.672y$	26
109	1.084	106	1.066	94	.994	101	1.036	104	1.054	100	1.030	95	1.000	99	1.024	$x=.592y$	27
109	1.084	106	1.066	94	.994	101	1.036	104	1.054	100	1.030	95	1.000	99	1.024	$x=.592y$	28
109	1.096	106	1.078	94	1.006	101	1.048	104	1.066	100	1.043	95	1.012	99	1.036	$x=.592y$	29
109	1.078	106	1.060	94	.988	101	1.030	104	1.048	100	1.024	95	.994	99	1.018	$x=.592y$	30
109	1.078	106	1.060	94	.988	101	1.030	104	1.048	100	1.024	95	.994	99	1.018	$x=.592y$	31
110	1.103	107	1.083	101	1.041	102	1.048	105	1.069	98	1.020	91	.971	95	1.000	$x=.698y$	32
110	1.104	108	1.090	103	1.056	102	1.048	102	1.049	96	1.007	92	.979	99	1.028	$x=.698y$	33
110	1.104	108	1.090	103	1.056	102	1.048	102	1.049	96	1.007	92	.979	99	1.028	$x=.698y$	34
88	.951	104	1.062	102	1.049	100	1.035	103	1.056	97	1.014	112	1.118	135	1.279	$x=.698y$	35
109	1.098	106	1.077	100	1.035	102	1.048	107	1.082	100	1.035	90	.963	91	.970	$x=.698y$	36
110	1.105	104	1.063	93	.986	108	1.091	103	1.056	105	1.069	103	1.056	78	.881	$x=.698y$	37
100	1.035	105	1.069	92	.979	96	1.007	121	1.181	[2]100	1.035	[2]95	1.000	[2]99	1.028	$x=.698y$	38
120	1.107	109	1.045	88	.928	103	1.012	111	1.056	96	.984	88	.928	94	.961	$x=.560y$	39
118	1.096	113	1.068	86	.917	99	.989	108	1.040	101	1.001	88	.928	100	.995	$x=.560y$	40
118	1.096	113	1.068	86	.917	99	.989	108	1.040	101	1.001	88	.928	100	.995	$x=.560y$	41
118	1.096	113	1.068	86	.917	99	.989	108	1.040	101	1.001	88	.928	100	.995	$x=.560y$	42
118	1.083	113	1.058	86	.924	99	.988	108	1.033	101	.998	88	.934	100	.993	$x=.495y$	43
112	1.062	105	1.023	98	.984	100	.995	112	1.062	97	.978	90	.939	101	1.000	$x=.560y$	44
112	1.062	105	1.023	98	.984	100	.995	112	1.062	97	.978	90	.939	101	1.000	$x=.560y$	45
128	1.152	108	1.040	82	.894	106	1.026	112	1.062	100	.995	85	.911	85	.911	$x=.560y$	46
95	.967	93	.956	90	.939	[2]101	1.000	[2]104	1.017	[2]100	.995	[2]95	.967	[2]99	.989	$x=.560y$	47
95	.967	93	.956	90	.939	[2]101	1.000	[2]104	1.017	[2]100	.995	[2]95	.967	[2]99	.989	$x=.560y$	48
140	1.219	107	1.034	67	.810	99	.989	104	1.017	102	1.006	87	.922	82	.894	$x=.560y$	49
120	1.107	109	1.045	88	.928	103	1.012	111	1.056	98	.984	88	.928	94	.961	$x=.560y$	50
120	1.107	109	1.045	88	.928	103	1.012	111	1.056	98	.984	88	.928	94	.961	$x=.560y$	51
120	1.107	109	1.045	88	.928	103	1.012	111	1.056	98	.984	88	.928	94	.961	$x=.560y$	52
120	1.124	109	1.047	88	.901	103	1.004	111	1.060	98	.970	88	.900	94	.942	$x=.698y$	53
120	1.124	109	1.047	88	.901	103	1.004	111	1.060	98	.970	88	.900	94	.942	$x=.698y$	54
120	1.124	109	1.047	88	.901	103	1.004	111	1.060	98	.970	88	.900	94	.942	$x=.698y$	55
120	1.124	109	1.047	88	.901	103	1.004	111	1.060	98	.970	88	.900	94	.942	$x=.698y$	56
120	1.124	109	1.047	88	.901	103	1.004	111	1.060	98	.970	88	.900	94	.942	$x=.698y$	57
104	1.035	99	1.000	98	.993	[2]101	1.015	[2]104	1.035	[2]100	1.007	[2]95	.972	[2]99	1.000	$x=.698y$	58
104	1.035	99	1.000	98	.993	[2]101	1.015	[2]104	1.035	[2]100	1.007	[2]95	.972	[2]99	1.000	$x=.698y$	59
104	1.035	99	1.000	98	.993	[2]101	1.015	[2]104	1.035	[2]100	1.007	[2]95	.972	[2]99	1.000	$x=.698y$	60
104	1.035	99	1.000	98	.993	[2]101	1.015	[2]104	1.035	[2]100	1.007	[2]95	.972	[2]99	1.000	$x=.698y$	61
104	1.035	99	1.000	98	.993	[2]101	1.015	[2]104	------	----	1.007	[2]95	.972	[2]99	1.000	$x=.698y$	62

[2] Production index for all industries combined.

TABLE 147.—NATURE AND SOURCE OF THE PRODUCTION INDEXES USED IN TABLE 146 [1]

INDUSTRY	FOR PERIOD FROM 1899 TO 1918, INCLUSIVE		FOR PERIOD FROM 1919 TO 1923, INCLUSIVE	
	Series used	Source [2]	Series used	Source [2]
All industries	"All manufactures" [4]	61	"Index for all lines combined"	(5)
Food, beverages, and tobacco	Indices for "Food," "Liquors," and "Tobacco," averaged.	61	"Tobacco, meat, flour, and sugar," averaged	Tables 38 and 42.
Food and kindred products	"Food"	61	"Meat, flour, and sugar" combined	Table 38.
Bread and other bakery products Flour-mill and gristmill products	"Wheat, apparent consumption"	58	"Wheat flour produced"	Table 33.
Confectionery	"Sugar, total supply"	58	"Sugar melted at Atlantic ports"	Table 36.
Slaughtering and meat packing	"Livestock" [6]	58	"Cattle and hogs slaughtered"	Table 37.
Liquors and beverages	"Liquors and beverages" [7]	58	"All lines combined"	Table 44.
Liquors, malt	"Liquors, fermented"			
Mineral and soda waters	"Liquors and beverages" [7]			
Tobacco manufactures Tobacco, cigars and cigarettes	"Tobacco"	61	"Tobacco"	Table 42.
Textiles, garments, and leather				
Textiles and their products Carpets and rugs Shirts Clothing, men's Clothing, women's	"Textiles"	61	"Cotton and wool" combined	Table 24.
Cotton manufactures	"Cotton, apparent consumption"	58	"Cotton manufactures"	Table 18.
Dyeing and finishing textiles Knit goods Silk goods	"Textiles"	61	"Cotton and wool" combined	Table 24.
Woolen and worsted goods	"Wool, apparent consumption"	58	"Wool manufacture"	Table 22.
Leather and its finished products Boots and shoes Leather, tanned, curried, and finished	"All manufactures"	61	"Sole and upper leather and boots and shoes," averaged. "Boots and shoes produced" "Sole and upper leather combined"	Tables 30 and 31. Table 30. Table 31.
Lumber and timber products				
Lumber and timber products Furniture Lumber, timber products Lumber, planing-mill products	"Lumber" [8]	61	"Yellow pine and Douglas fir" combined	Table 8.
Paper and printing				
Paper and printing Paper and wood pulp Printing and publishing, book and job Printing and publishing, newspapers	"All manufactures"	61	("Paper produced, total tonnage; newsprint consumed," averaged.) [9] "Paper produced, total tonnage, all varieties." [9]	Tables 10 and 14. Table 10.

Stone, clay, glass, and chemicals	"Chemicals" and "Stone, clay, and glass," averaged.	61		
Chemicals and allied products	"Chemicals"	61	"All lines" combined	Table 44.
Chemicals				
Petroleum refining	"Petroleum, marketed production"	58		
Stone, clay, and glass products	"Stone, clay, and glass"	61		
Brick and tile, terra-cotta, and fire-clay	"Clay (raw), production"	59		
Glass	"Glass sand, production"	59		
Metals, vehicles, railroad cars, and miscellaneous	"Iron and steel," "Metals, nonferrous," and "Vehicles," averaged.	61		
Iron and steel and their products	"Iron and steel"	61	"Iron and steel" combined	Table 3.
Iron and steel, blast furnaces				
Iron and steel, steel works and rolling mills				
Foundry and machine-shop products				
Metals and metal products, other than iron and steel	"Apparent consumption, copper, zinc (primary), lead (primary)," averaged.	59		
Smelting and refining				
Vehicles for land transportation	"Vehicles"	61		
Automobile bodies and parts	"Automobiles" [10]			
Automobiles	"Automobiles"	59		
Cars, steam-railroad	"Steam-railroad cars" [11]			
Railroad repair shops				
Railroad repair shops—electric				
Railroad repair shops—steam				
Miscellaneous	"Iron and steel," "Metals, nonferrous," and "Vehicles," averaged.	61	"All lines" combined	Table 44.
Agricultural implements				
Rubber goods				
Shipbuilding, steel				
Electrical machinery, apparatus, and supplies				

[1] Almost without exception, the production indices in this table are those developed by E. E. Day and published in the Review of Economic Statistics, issued by the Harvard University Committee on Economic Research. Some of the more recent figures appeared in the Weekly Letter of the Harvard Economic Service. The production series used here are his adjusted indices. Those for the years from 1899 to 1918 inclusive, are on the base: Ordinates of secular trend 1899–1913 equals 100. The index numbers used for the years 1919–1923, inclusive, are also his adjusted figures, the base for which he describes by the word "normal." The base for the earlier period, resting on the trend from 1899–1913 is taken by the present writer as equivalent to the use of normal as base.

[2] The figures in this column are the page numbers of E. E. Day's article on "An Index of the Physical Volume of Production" in the January, 1921, issue of the Review of Economic Statistics. The figures given are the pages in the reprint of the article published by the Committee on Economic Research in 1921.

[3] References in this column are to table numbers in the January, 1923, issue of the Review of Economic Statistics, the article from which they are taken, being the one by E. E. Day on "Cyclical Fluctuation of the Volume of Manufacture." The figures are in monthly form on the base—normal equals 100. For our purpose the monthly "adjusted relatives" have been averaged for the corresponding yearly relatives. The figures for 1923 are taken from the continuation of Mr. Day's index in the issues of the Harvard Economic Service bulletins issued during the year 1924. Those for 1924 are from the Review of Economic Statistics Supplement July, 1925, those for 1925 from Harvard Economic Service Weekly Letter, August 29, 1925, and January 23, 1926. The following differences in the production series used may be noted for the years 1924 and 1925: For food and kindred products Day's index for the food group; for textiles, garments, and leather, mean of Day's series for cotton, wool, leather, and boots and shoes; for carpets and rugs, Day's index for carpets and rugs; for leather and its finished products, Day's group index for leather; for lumber and timber products and for each subdivision within the group, Day's group index for lumber; for vehicles for land transportation, Day's index for equipment and vehicles; for automobile bodies and parts and for automobiles, Day's index for automobiles produced.

[4] The production index for "All manufactures" is described as an "adjusted index obtained by expressing the unadjusted index for all manufactures as a percentage of the ordinate of secular trend computed for that index."

[5] The figure for all industries combined for 1923 is obtained from the Harvard Economic Service weekly bulletin of January 24, 1924, p. 55.

[6] "Receipts of livestock in 7 cities." The index used here is the mean ratio of the three given by Day for each year for cattle, hogs, and sheep received.

[7] The figures used here are the mean of Day's index numbers for liquors distilled and liquors fermented. His figures are for fiscal years ending June 30.

[8] "Relative to ordinates of secular trend for 1904–1913."

[9] The 1923 production indices are based upon the data for the first five months of the year.

[10] Figures used are averages of Day's index numbers for 1, "passenger automobiles, production"; 2, "automibile trucks production."

[11] Figures used are averages of Day's index numbers for 1, "freight cars, production;" and 2, "passenger cars, production."

Chapter XVI

CONVERSION OF FULL-TIME TO ACTUAL EARNINGS: THE BENCH-MARK RATIO

The upshot of the procedure described in the last chapter is an index of the relative fluctuations in employment for manufacturing industry generally, for its chief subdivisions, and for certain selected industries. Such an index can not be used for direct application to our full-time earnings data for the reduction of those earnings to sums actually received. The reason for this is that the employment index, being an indicator of relative change only, does not tell us anything about the amount of unemployment or about the proportion of actual employment to full employment at any given time. It tells us only that from 1920 to 1921 the volume of employment dropped from 102 to 85, or 17 per cent, for all manufacturing industries combined. We do not know from these figures, however, anything definite about the actual amount of unemployment in either the year 1920 or the year 1921. The index numbers 102 and 85 are relative to a base described as normal, but even as to periods when industrial conditions are normal we know, at least from the data so far used, nothing whatever about the *amount* of unemployment.

If it were possible to get reliable information indicating for any one of the years between 1899 and 1925 the amount of unemployment, or, in other words, the fraction of full employment, and if such information should be available in a form which would show the different proportions of actual to full employment in the different industries, or at least in the leading groups of industries, then our problem would seem to be in a fair way to solution, for such an estimate for any given year could, quite obviously, be used as a bench mark to indicate at any given point on our index curve of relative unemployment, the amount of unemployment at that point on the curve. Similarly, corresponding bench marks for the different industrial groups could be applied (at the year to which they refer) to the proper industry index of employment. This done, the bench-mark values could be multiplied by the higher or lower employment ratios for other points in the several series of employment relatives, producing a series of derived ratios, of fractions, of full employment for each of the other years for the period under review. Such a series of ratios of actual to full employment would remedy the defect which we have just pointed out in the simple index number of em-

ployment, and it then could be applied to the full-time earnings figures for their reduction to estimated actual earnings.

It was thought at first that the desired bench mark might be constructed from the Census Bureau's statistics on numbers of wage earners unemployed for varying lengths of time, as reported for different industries in connection with the population censuses of 1890 and 1900. These figures, however, were abandoned for three reasons: They are very far out of date, the census having reported no figures on unemployment since 1900. Their industrial classification could be fitted to the classification of industries used in this monograph only with the greatest difficulty, since the census unemployment figures were taken in connection with the decennial census of population. The final and determining reason for abandoning them, however, was that there have appeared, quite recently, figures which are not only more up to date, but more directly applicable to the present analysis. It may be said parenthetically that the New York figures on trade unionists unemployed during the period 1899 to 1915 were considered. They were rejected, however, for reasons similar to those which dictated the rejection of the census material. Naturally, there was the additional consideration that the New York figures had, necessarily, a much narrower geographic jurisdiction and only at some hazard could be corrected for use as figures representing the whole of the United States.

The bench mark which has been used in the tables of actual earnings in this book is built of materials taken from the report, already used on "Employment hours and earnings in prosperity and depressions" issued by the National Bureau of Economic Research. The series bench-mark ratios used in this monograph are the arithmetic means of two separate and distinct series of ratios, each of which was constructed independently of the other and out of somewhat different materials. It should be said, however, that the materials in each case are taken from the report above referred to. The first series of ratios to be described will be referred to as Method A ratios and the second as Method B ratios. When the ratios on the Method A basis had been computed, an examination of them in connection with such other fragmentary figures on the amount of unemployment as could be laid hold of seemed to indicate pretty definitely that these ratios were, if anything, too low. This conviction led to an attempt to work out from other figures reported by the National Bureau and by a different method an entirely new set of ratios of actual to full employment. This second set of ratios turned out to be considerably higher than the first. For "all industries" the margin between the two sets was about 15 per cent; for the individual selected industries the margins between the two ranged from 1 per cent in brick and tile, terra-cotta, and fire-clay products to 32 per cent in petroleum refining.

A comparison of the two series of ratios for all industries combined is given in Table 148.[1]

In view of these differences, and after giving the matter a good deal of thought, it was decided that the true ratio of actual to full employment must fall somewhere between the result obtained by Method A and the result obtained by Method B. It was felt, consequently, that the nearest approach to an accurate estimate of the fraction of full employment would be made by striking a simple average between the figures resulting from the two methods. It is not presumed, by any means, that the final fraction of employment thus arrived at is a perfectly accurate representation of the fractions of full employment in the different industries and at the different periods, but it is the closest approximation to the true proportion that we have been able to make. In Table 148, the two series of ratios, A and B, the

TABLE 148.—COMPUTATION OF ESTIMATED RATIOS, ACTUAL TO FULL EMPLOYMENT, ALL INDUSTRIES COMBINED: 1899–1924

YEAR	Employment index [1] (by regression)	Ratio, actual to full employment (Method A)	Same (Method B) starting from ratio actual to full employment in peak year	Final ratio, mean of Methods A and B	National Bureau of Economic Research [2]	Percentage employed of estimated normal supply [3] (Hart)
1899	1.003	0.780	0.917	0.849	----------	90.0
1900	.975	.758	.891	.825	----------	88.5
1901	1.010	.785	.923	.854	----------	90.5
1902	1.038	.807	.949	.878	----------	85.9
1903	1.017	.791	.929	.860	----------	90.7
1904	.968	.753	.885	.819	----------	88.5
1905	1.052	.819	.962	.891	----------	90.7
1906	1.073	.835	.981	.908	----------	94.5
1907	1.052	.819	.962	.891	95.1	94.0
1908	.912	.710	.833	.772	82.5	85.2
1909	1.024	.796	.936	.866	95.8	91.4
1910	1.010	.785	.923	.854	94.4	93.5
1911	.954	.742	.872	.807	94.1	89.2
1912	1.024	.796	.936	.866	96.8	90.4
1913	1.024	.796	.936	.866	94.9	90.7
1914	.947	.736	.866	.801	91.0	84.2
1915	.982	.764	.897	.831	87.8	84.0
1916	1.073	.835	.981	.908	96.9	92.9
1917	1.038	.807	.949	.878	97.5	95.3
1918	1.017	.791	.929	.860	96.1	----------
1919	1.000	.778	.914	.846	93.5	----------
1920	1.021	.794	.933	.864	93.8	----------
1921	.846	.658	.773	.716	77.6	----------
1922	.972	.756	.888	.822	85.1	----------
1923	1.070	.832	.978	.905	----------	----------
1924	.993	.772	.908	.840	----------	----------

[1] From Table 146.

[2] For 1909–1918 from 2 Income in the United States, 39. Figures for other years computed from unpublished monthly ratios courteously put at the writer's disposal by the National Bureau of Economic Research. The bureau defines these figures as "an estimate of the ratio of the average number of employees at work to the average number of employees attached to the industry."

[3] 1902–1917, Hart, Hornell, Fluctuations in Employment in Cities of the United States, 1902–1917, p. 48. Mr. Hart's figures are the percentages unemployed of the "normal supply of nonagricultural workers" [illegible]. We have taken the complements of his percentages, 1899–1901, as estimated by George Soule in hearings before Committee on Labor on H. R. 11956, June 30, 1922, p. 24.

[1] See also for a comparison of the results under the two methods as they affect the estimated amounts of annual earnings, Table 13, on p. 42.

final ratios obtained from them and the (regression method) employment index explained in the last chapter are given for all industries combined for each year from 1899 to 1925. For purposes of comparison, two analogous series from outside sources are inserted in the table. One of these is the series of "ratios of the average number of employees at work to the average number * * * attached to industry" worked out by the National Bureau of Economic Research; the other is Hornell Hart's series [2] of percentages unemployed of "the estimated normal supply" of labor. The data of Table 148 are presented in graphic form in Figure 31.

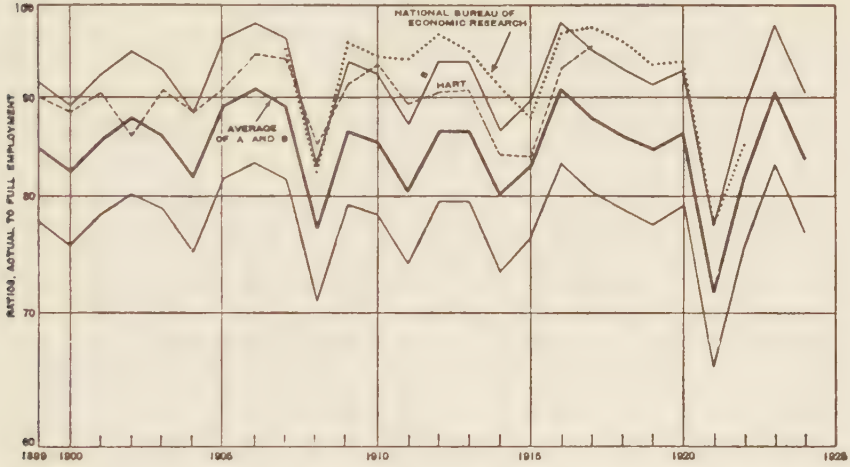

FIG. 31.—COMPARISON OF ESTIMATES OF PROPORTIONS OF ACTUAL TO FULL EMPLOYMENT: 1899–1925

CONSTRUCTION OF BENCH-MARK RATIO, METHOD A

The method of construction of the bench-mark ratio by the first method is illustrated by the figures in Table 149. The desired ratios of actual to full employment are derived from the ratios between the National Bureau's figures [3] representing by quarters the number of hours actually worked in 1921 and the figure showing the number of scheduled full-time hours in the maximum quarter of 1920, this maximum quarter being the third. The latter figures appear in column A of Table 149; the figures for hours actually worked in column D. The ratios between figures in column A and column D are not, however, believed accurately to represent, without some modification of the figures in column A, the ratios of actual to full employment. The reason for this skepticism is that it seems certain that even the figures for full-time hours in the maximum quarter of

[2] See footnote 3 to Table 148.
[3] In Employment, Hours, and Earnings in Prosperity and Depression, pp. 82, 87.

1920 fall short, by an appreciable margin, of full employment for all attached to industry, it being in that sense that the term "full employment" is used in this monograph.[4] The phrase "full employment" means the extent of the employment necessary to give to all attached to industry full-time work regularly throughout the year. It is inconsistent, of course, to interpret as full employment an amount of employment which would be sufficient to employ

TABLE 149.—CONSTRUCTION OF EMPLOYMENT BENCH MARK BY METHOD A

GROUP	Thousands of full-time hours in maximum quarter of 1920 [1] (third quarter) A	Estimated per cent of full employment [2] represented by these hours [3] B	Estimated thousands of full-time hours required for full employment of all attached to industry in maximum quarter of 1920 (third quarter) C	MILLIONS OF HOURS ACTUALLY WORKED IN 1921 [4] D			
				First quarter	Second quarter	Third quarter	Fourth quarter
All factories	7,488,209	0.95	7,882,324	5,406	5,148	5,045	5,152
Food	772,201	.95	812,843	573	564	628	627
Lumber	731,648	.94	778,349	530	608	594	551
Metals	3,471,426	.96	3,616,069	2,244	1,857	1,679	1,736
Paper	402,345	.97	414,789	375	359	352	379
Mineral	592,729	.97	611,061	492	474	474	488
Textile	1,517,860	.93	1,632,108	1,189	1,284	1,315	1,368

GROUP	RATIOS TO FULL EMPLOYMENT IN 1921 [5] D—Continued				Estimated ratio, actual to full employment, 1921 [6] E
	First quarter	Second quarter	Third quarter	Fourth quarter	
All factories	0.686	0.653	0.640	0.654	0.658
Food, drink, and tobacco	.705	.694	.773	.771	.735
Lumber	.681	.781	.763	.708	.733
Metals	.621	.514	.464	.480	.519
Paper and printing	.904	.866	.849	.914	.883
Mineral	.805	.776	.776	.799	.789
Textile and leather	.729	.787	.806	.838	.790

[1] Unpublished data kindly furnished by the National Bureau of Economic Research.
[2] For all persons attached to the industry.
[3] Percentage for "all factories" is an estimate based on ratios given in 2 Income in the United States, p. 39; estimates for the 6 industry groups based on proportions shown by dividing numbers of hours actually worked in third quarter of 1920 ("Employment Hours and Earnings," p. 55) by full-time hours of col. A.
[4] "Employment Hours and Earnings," p. 55.
[5] Obtained by dividing "hours actually worked" by hours in col. C.
[6] Simple arithmetic mean of the ratios for each quarter allocated to the selected industries.

regularly throughout the year all attached to industry at more than full time. In other words, it is not believed that the revision of the full-time hours figures in column A results in any illegitimate stretching of full employment to include overtime. The revision takes up the slack represented by the margin of difference between full-time employment for those actually employed in industries in the third quarter of 1920, and full-time employment for all attached to industry

[4] "According to the best available evidence from 1 to 3 per cent of those attached to an industry are idle even at the peak of a boom"—National Bureau of Economic Research, Income in the Various States, p. 22.

at that time. This revision of figures of column A rests, then, on the belief that even in the third quarter of 1920 there was a considerable number of unemployed persons in the United States.

The ratio between the number employed in the maximum quarter of 1920 and the total number attached to industry, is roughly represented by the percentage in column B the figures in which are taken from the results of investigations by the National Bureau of Economic Research.[5]

The figures are described by that bureau as representing ratios of the "average number of employees at work, to the average number of employees attached" to industry. The figures used are the bureau's figures for factory industries. It is assumed that these ratios of workers employed to workers attached to industry fairly represent the per cent of full employment involved in the full-time hours for the peak period of business activity in the third quarter of 1920.

Applying the ratios of column B to the figures of column A by dividing the latter figures by the former, their result expanded estimates of the number of full-time hours required for full employment of all attached to industry, for the maximum quarter of 1920. These figures are given in round thousands in column C. The next step is to divide the number of hours actually worked, successively for each quarter in 1921, by the figures in column C. The resulting ratios of actual to full employment are given in the lower part of the table. These quarterly ratios finally are averaged to get the annual figures shown in column E. These last figures are estimated ratios of actual to full employment for the year 1921.

It is now necessary to describe the method by which this bench-mark ratio for 1921 is applied to the employment indices described in the last chapter. The procedure is relatively simple. The bench mark, taking "all industries" for an example, is 0.658 for 1921, as shown in Table 149. This ratio is placed alongside the employment index for "all industries" for the year 1921. For that year the employment index as shown in Table 148 was 0.846 on the 1919 base. We have, then, for each of the other years for which we wish fractions of full employment, three known terms of an equation and the employment ratio for any particular year is worked out on the basis of such a proportion as the following one:

$$0.846 : 1.070 : : 0.658 : x$$

where the figures are for 1921 and 1923 and where x represents the bench-mark ratio for the year 1923 and has the value : 0.832.[6]

[5] Income in United States, p. 39.

[6] The resulting ratios of actual to full employment (Method A) are shown for "all industries" alongside those derived from Method B in Table 148. The ratios for the separate industries, along with the corresponding employment indices, are given in Tables 156 and 157.

CONSTRUCTION OF BENCH-MARK RATIO, METHOD B

The construction procedure for the bench-mark ratio according to Method B, although it makes large use of the National Bureau's results, is not based upon the same set of figures from its report on Employment, Hours, and Earnings as in the bench-mark ratio constructed by Method A. Moreover, the bench-mark ratios resulting from the second method are not all for the same year, but for different years in the case of different industries. The procedure can be illustrated by reference to the data in Table 150.

TABLE 150.—CONSTRUCTION OF EMPLOYMENT BENCH MARK BY METHOD B

INDUSTRIAL DIVISION, INDUSTRY GROUP, AND SELECTED INDUSTRY	Peak year of employment [1]	Index in peak year (normal = 100)	Assumed ratio, actual to full employment in peak year
All industries	1916	1.073	0.981
Food, beverages, and tobacco	1919	1.036	.979
Food and kindred products	1918	1.049	.979
Bread and other bakery products	1905	1.189	.979
Flour-mill and gristmill products	1905	1.189	.979
Confectionery	1922	1.182	.979
Slaughtering and meat packing	1918	1.049	.979
Liquors and beverages	1907	1.113	.979
Liquors, malt	1923	1.108	.979
Mineral and soda waters	1907	1.113	.979
Tobacco manufactures	1920	1.119	.979
Tobacco, cigars and cigarettes	1920	1.119	.979
Textiles, garments, and leather	1916	1.228	.960
Textiles and their products	1916	1.228	.960
Carpets and rugs	1916	1.228	.960
Shirts	1916	1.228	.960
Clothing, men's	1916	1.228	.960
Clothing, women's	1916	1.228	.960
Cotton manufactures	1917	1.076	.960
Dyeing and finishing textiles	1916	1.228	.960
Knit goods	1916	1.228	.960
Silk goods, including throwsters	1916	1.228	.960
Woolen and worsted goods	1916	1.442	.960
Leather and its finished products	1923	1.121	.960
Boots and shoes	1916	1.065	.960
Leather, tanned, curried, and finished	1923	1.226	.960
Lumber and timber products	1923	1.154	.956
Lumber and timber products	1923	1.154	.956
Furniture	1923	1.154	.956
Lumber, timber products	1923	1.154	.956
Lumber, planing-mill products, not including planing mills connected with sawmills	1923	1.154	.956
Paper and printing	1923	1.226	.987
Paper and printing	1923	1.226	.987
Paper and wood pulp	1923	1.131	.987
Printing and publishing, book and job	1923	1.102	.987
Printing and publishing, newspapers and periodicals	1923	1.102	.987
Stone, clay, glass, and chemicals	1923	1.104	.990
Chemicals and allied products	1918	1.202	.990
Chemicals	1918	1.202	.990
Petroleum refining	1899	1.279	.990
Stone, clay, and glass products	1923	1.104	.990
Brick and tile, terra-cotta, and fire-clay products	1907	1.119	.990
Glass	1902	1.181	.990

[1] From Table 146.

TABLE 150.—CONSTRUCTION OF EMPLOYMENT BENCH MARK BY METHOD B—Continued

INDUSTRIAL DIVISION, INDUSTRY GROUP, AND SELECTED INDUSTRY	Peak year of employment	Index in peak year (normal = 100)	Assumed ratio, actual to full employment in peak year
Metals, vehicles, railroad cars, and miscellaneous	1916	1.163	0.997
Iron and steel and their products	1916	1.096	.997
Iron and steel, blast furnaces	1916	1.096	.997
Iron and steel, steel works and rolling mills	1916	1.096	.997
Foundry and machine-shop products	1916	1.063	.997
Metals and metal products, other than iron and steel	1916	1.185	.997
Smelting and refining, copper, lead, and zinc	1916	1.185	.997
Vehicles for land transportation	1907	1.247	.997
Automobile bodies and parts	1916	1.292	.997
Automobiles	1916	1.292	.997
Cars, steam-railroad	1907	1.510	.997
Railroad repair shops	1916	1.163	.997
Railroad repair shops—electric	1916	1.163	.997
Railroad repair shops—steam	1916	1.163	.997
Miscellaneous	1916	1.194	.997
Agricultural implements	1916	1.194	.997
Rubber goods	1916	1.194	.997
Shipbuilding, steel	1916	1.194	.997
Electrical machinery, apparatus, and supplies	1916	1.194	.997

The first step is to earmark the peak year of the employment index, shown in Table 146. This peak year, the year of maximum employment of the whole period from 1899 to 1925, is shown for each industry in the first column of Table 150. For all industries combined the peak year is 1916, for which year the index given in the table is 1.073. The second step is to arrive at a ratio of actual to full employment for that peak year. This ratio is assumed to be represented by the fraction of full time worked reported by the National Bureau of Economic Research for the maximum quarter for 1920. For "all industries" the maximum quarter of 1920 was the first, and the per cent of full time worked for all (factory) industries was 98.1.[7]

This percentage is then entered in the third column of Table 150 in the form of a ratio (0.981) as the assumed fraction to full employment in the peak year. In similar fashion peak-year ratios for the different industry groups have been calculated. It is evident that we have here, as in the case of Method A, only six industrial variations in the ratios. These six ratios are distributed among subordinate groups of industries and individual selected industries as indicated in the last column of Table 150.

The method of deriving from the peak-year ratios other ratios for earlier and later years by application of the peak-year ratio to the employment index is similar to the analogous step already described in the discussion of Method A in the preceding section. It is illus-

[7] Employment, Hours and Earnings, p. 49. The table is entitled "An estimate for continental United States of per cent of full time worked by the average employee while on the pay roll in enterprises of all sizes."

trated in Table 151.[5] As indicated above, it is believed that this new series of ratios constructed by Method B represents too high a figure for the true ratio of actual to full employment, and, as explained above, an average is struck between this series and the first series described to produce the final series of fractions of full employment used in Parts I to III of this monograph. These final ratios for each industry are shown by census years in Table 152.

TABLE 151.—INDEX OF EMPLOYMENT AND (METHOD B) FRACTIONS OF FULL EMPLOYMENT, ALL INDUSTRIES COMBINED, EACH YEAR: 1899–1925

YEAR	Index and employment (regression methods), all industries[1]	Ratio, actual to full employment assumed at peaks[2]	Estimated ratios, actual to full employment	YEAR	Index and employment (regression methods), all industries[1]	Ratio, actual to full employment assumed at peaks[2]	Estimated ratios, actual to full employment
1899	1.003		**0.917**	1913	1.024		0.935
1900	.975		.892	1914	.947		.866
1901	1.010		.924	1915	.982		.896
1902	1.008		.949	1916	1.073	0.981	.981
1903	1.017		.930	1917	1.008		.949
1904	.965		.885	1918	1.017		.930
1905	1.032		.962	1919	1.000	.915	**.914**
1906	1.073	0.981	.981	1920	1.021		.934
1907	1.052		.962	1921	.846		**.773**
1908	.912		.834	1922	.972		.890
1909	1.024		**.936**	1923	1.070		**.978**
1910	1.010		.924	1924	.993		.905
1911	.954		.871	1925	1.048		**.959**
1912	1.024		.935				

[1] From Table 146.

[2] From National Bureau of Economic Research, Employment Hours and Earnings, p. 49. Assumption is that the ratio is the same as the National Bureau's "per cent of full time worked by average employee while on pay roll" for highest quarter of 1920. This also causes the assumption (not entirely true) that in the peak years of the employment index all those attached to the industry are employed at least the proportion of full-time indicated in this column.

TABLE 152.—FINAL RATIOS, ACTUAL TO FULL EMPLOYMENT, BY INDUSTRIAL DIVISIONS, INDUSTRY GROUPS, AND SELECTED INDUSTRIES; AND PERCENTAGE DEVIATION FOR EACH INDUSTRY CLASSIFICATION FROM MAXIMUM AND MINIMUM RATIOS

INDUSTRY GROUP	CENSUS YEAR							Per cent deviation[1]
	1899	1904	1909	1914	1919	1921	1923	
All industries	0.849	0.819	0.886	0.801	0.846	0.716	0.906	9
Food, beverages, and tobacco	.818	.846	.842	.820	.884	.824	.882	12
Food and kindred products	.769	.824	.862	.802	.905	.802	.862	9
Bread and other bakery products	.743	.821	.832	.765	.827	.739	.776	3
Flour-mill and gristmill products	.743	.821	.832	.765	.827	.739	.776	3
Confectionery	.776	.739	.782	.810	.832	.739	.787	3
Slaughtering and meat packing	.901	.844	.819	.776	.912	.782	.918	7
Liquors and beverages	.846	.866	.826	.864	.888	.755	.950	3
Liquors, malt	.866	.890	.866	.871	.890	.757	.962	3
Mineral and soda waters	.846	.866	.826	.864	.888	.755	.950	3
Tobacco manufactures	.825	.829	.817	.817	.829	.812	.854	10
Tobacco, cigars and cigarettes	.825	.829	.817	.817	.829	.812	.854	10

[1] This percentage marks the deviation from maximum (Method B and minimum (Method A) ratios, of which ratios in this table constitute the mean. It should be noted that in few cases Method B produced lower ratios than Method A.

[2] The ratios resulting under Method B for all industries are shown alongside of those resulting under Method A in Table 148.

TABLE 152.—FINAL RATIOS, ACTUAL TO FULL EMPLOYMENT, BY INDUSTRIAL DIVISIONS, INDUSTRY GROUPS, AND SELECTED INDUSTRIES; AND PERCENTAGE DEVIATION FOR EACH INDUSTRY CLASSIFICATION FROM MAXIMUM AND MINIMUM RATIOS—Continued

INDUSTRY GROUP	CENSUS YEAR							Per cent deviation
	1899	1904	1909	1914	1919	1921	1923	
Textiles, garments, and leather	0.829	0.815	0.860	0.832	0.805	0.772	0.861	2
Textiles and their products	.829	.815	.860	.832	.805	.772	.861	2
Carpets and rugs, other than rag	.829	.815	.860	.832	.805	.772	.861	2
Shirts	.829	.815	.860	.832	.805	.772	.861	2
Clothing, men's	.829	.815	.860	.832	.805	.772	.861	2
Clothing, women's	.829	.815	.860	.832	.805	.772	.861	2
Cotton manufactures	.861	.840	.865	.865	.855	.831	.865	5
Dyeing and finishing textiles, exclusive of that done in textile mills	.829	.815	.860	.832	.805	.772	.861	2
Knit goods	.829	.815	.860	.832	.805	.772	.861	2
Silk goods, including throwsters	.829	.815	.860	.832	.805	.772	.861	2
Woolen and worsted goods	.651	.765	.850	.759	.717	.741	.837	6
Leather and its finished products	.864	.834	.881	.817	.876	.776	.978	2
Boots and shoes, not including rubber boots and shoes	.886	.856	.904	.838	.892	.803	.894	2
Leather, tanned, curried, and finished	.831	.802	.848	.786	.843	.741	1.028	6
Lumber and timber products	.808	.802	.820	.769	.820	.752	.933	3
Lumber and timber products	.808	.802	.820	.769	.820	.752	.933	3
Furniture	.808	.802	.820	.769	.820	.752	.933	3
Lumber, timber products	.808	.802	.820	.769	.820	.752	.933	3
Lumber, planing-mill products, not including planing mills connected with sawmills	.808	.802	.820	.769	.820	.752	.933	3
Paper and printing	.878	.852	.894	.837	.894	.833	1.051	6
Paper and printing	.878	.852	.894	.837	.894	.833	1.051	6
Paper and wood pulp	.944	.917	.862	.901	.951	.848	1.031	4
Printing and publishing, book and job	.900	.873	.917	.859	.922	.896	.974	1
Printing and publishing, newspapers and periodicals	.900	.873	.917	.859	.922	.896	.974	1
Stone, clay, glass, and chemicals	.896	.933	.939	.877	.928	.790	.989	0
Chemicals and allied products	.884	.908	.884	.872	.890	.758	.949	4
Chemicals	.884	.908	.884	.872	.890	.758	.949	4
Petroleum refining	1.068	.876	.851	.876	.864	.736	.921	7
Stone, clay, and glass products	.869	.928	.953	.840	.928	.790	.989	0
Brick and tile, pottery, terra-cotta, and fire-clay products	.785	.878	.915	.803	.922	.785	.983	1
Glass	.891	.848	.800	.873	.897	.764	.957	3
Metals, vehicles, railroad cars, and miscellaneous	.759	.732	.799	.732	.776	.568	.847	10
Iron and steel and their products	.811	.748	.826	.702	.802	.587	.875	13
Iron and steel, blast furnaces	.811	.748	.825	.702	.802	.587	.875	13
Iron and steel, steel works and rolling mills	.811	.748	.826	.702	.802	.587	.875	13
Foundry and machine-shop products	.801	.745	.813	.706	.793	.606	.857	17
Metals and metal products, other than iron and steel	.781	.769	.791	.739	.769	.563	.838	8
Smelting and refining, copper, lead, and zinc	.781	.769	.791	.739	.769	.563	.838	8
Vehicles for land transportation	.693	.680	.774	.752	.748	.548	.816	5
Automobile bodies and parts	.739	.701	.768	.747	.735	.538	.801	4
Automobiles	.739	.701	.768	.747	.735	.538	.801	4
Cars, steam-railroad	.618	.560	.590	.603	.679	.497	.741	4
Railroad repair shops	.759	.732	.799	.732	.776	.568	.847	10
Railroad repair shops—electric	.759	.732	.799	.732	.776	.568	.847	10
Railroad repair shops—steam	.759	.732	.799	.732	.776	.568	.847	10
Miscellaneous	.688	.658	.733	.658	.719	.606	.769	17
Agricultural implements	.688	.658	.733	.658	.719	.606	.769	17
Rubber goods	.688	.658	.733	.658	.719	.606	.769	17
Shipbuilding, steel	.688	.658	.733	.658	.719	.606	.769	17
Electrical machinery, apparatus, and supplies	.688	.658	.733	.658	.719	.606	.769	17

FRACTIONS OF FULL EMPLOYMENT FOR GEOGRAPHIC REGIONS

It has already been explained that a separate employment index has been utilized for the Northeast region of the country, the special index for this region being the one derived from adjusted employment figures for New Jersey combined with Massachusetts, without cotton. This employment index for the Northeast and the all-

industries index calculated by the regression method have been used as starting points for the calculation of a separate series of benchmark ratios for the three geographic regions—Northeast, South, and West. The exact method may be explained by reference to Table 153. In the next to the last column of this table, following the employment indexes just mentioned, are a series of ratios which represent the fractions of full time worked by the average employee

TABLE 153.—EMPLOYMENT INDEXES AND FRACTIONS OF FULL EMPLOYMENT, FOR GEOGRAPHIC REGIONS, WITH SPECIAL SERIES FOR COTTON AND FOR THE STATES OF MASSACHUSETTS AND NEW JERSEY

REGION (OR INDUSTRY)	CENSUS YEAR							Fraction of full time worked by average employee on pay roll, 1921 [1]	Ratio of region of United States
	1899	1904	1909	1914	1919	1921	1923		
	EMPLOYMENT INDEX								
United States, all industries	1.003	0.968	1.024	0.947	1.000	0.846	1.070	0.924	1.000
South								.901	.975
West								.957	1.035
Northeast [2]	.975	.964	1.017	.958	1.112	.816	(1.000)	.901	.975
Cotton, United States [3]	.991	.947	1.045	.992	1.053	.981			
Cotton, United States [4]	1.012	.987	1.017	1.017	1.005	.976	1.017		
Massachusetts [5]	.900	.912	.978	.935	1.098	.809			
New Jersey [5]	.968	.945	.987	.923	1.065	.780			
	FRACTION OF FULL EMPLOYMENT								
United States, all industries	0.849	0.819	0.866	0.801	0.846	0.716	0.905		
South	.828	.799	.844	.781	.825	.698	.882		
West	.879	.848	.896	.829	.876	.741	.937		
Northeast [6]	.820	.817	.862	.805	.941	.692	.846		
Cotton, United States [3]	.846	.809	.893	.847	.900	.838			
Cotton, United States [4]	.861	.840	.865	.865	.855	.831	.865		
Massachusetts [5]	.758	.768	.823	.788	.925	.682			
New Jersey [5]	.821	.802	.839	.783	.904	.662			

[1] Employment, Hours and Earnings, p. 49; average of the figures for the four quarters of 1921.
[2] Index for 1923 based on employment data for Massachusetts, New York, and Wisconsin, compared with United States, 1921 and 1923, in Survey of Current Business, May, 1924, pp. 169, 170.
[3] Based on employment data for cotton in Massachusetts.
[4] By regression method.
[5] From State data on number of wage earners on pay rolls, "all industries."
[6] For United States, "all industries," per cent difference between Method A and Method B is 15 per cent; the mean is 7.5 per cent higher than Method A ratio; but employment in East is 2.5 per cent lower than in United States; final series of ratios for East is computed by multiplying its "A" series by 1.05 (0.780×1.05=0.820).

while on the pay roll in 1921. The fractions for the three regions are from unpublished records kindly furnished by the National Bureau of Economic Research. The fraction for all industries is derived from that bureau's published quarterly figures by striking an average of the four quarters.[9] The regional ratios given in the column referred to were computed by averaging the quarterly figures supplied by the bureau. It is assumed that each of the three geographic

[9] Employment, Hours, and Earnings, p. 49.

regions is related to the United States as a whole, in respect to the extent of unemployment in that region, in the proportions indicated by the fraction of full time worked in the different regions in 1921, and the regional ratios in the last column of Table 153 are directly based upon those fractions. For convenience the fraction for the United States as a whole (0.924) is set down as 1.000 and three index numbers calculated on this base for each of the three regions. The regional ratios are then computed by multiplying the fraction of full employment for the United States as a whole by the regional index number; thus, the United States ratio for 1899, 0.849, multiplied by 0.975 gives a ratio of 0.828 which represents the regional ratio for that year for the South. The ratios for the other years and regions are worked out in similar fashion. Attention should be called to the fact that the ratios for all industries in the United States as a whole are arithmetic means of the two series of ratios described in the preceding sections, namely, series A and series B. It should also be pointed out that the series of ratios for the Northeast region are derived as explained in the footnote to Table 153 from the Method A ratios by multiplying those ratios by the coefficient 1.05, which, as explained in footnote 6, is the estimated per cent of difference between employment in the Northeast and employment in the United States as a whole. Thus, $0.780 \times 1.05 = 0.820$, the ratio for 1899 for the Northeast region.[10]

Fractions of full employment for intercensal years, between 1914 and 1925, are required for the computation of actual earnings for 12 of our selected industries. The method of calculation is the one already explained for these same industries in the case of census years. The results are in Table 154. For the first half of the period

TABLE 154.—ESTIMATED FRACTIONS OF FULL EMPLOYMENT FOR THOSE OF THE 41 SELECTED INDUSTRIES FOR WHICH THE FEDERAL BUREAU OF LABOR STATISTICS HAS RECORDS OF CHANGES IN PER CAPITA EARNINGS FROM 1915; FOR INTERCENSAL YEARS: 1915, 1916, 1917, 1918, 1920, 1922, AND 1924

INDUSTRY	FRACTIONS OF FULL EMPLOYMENT						
	1915	1916	1917	1918	1920	1922	1924
Woolen and worsted goods	0.800	1.030	0.850	0.845	0.665	0.780	0.710
Cotton manufactures	.865	.905	.915	.905	.850	.850	.820
Silk goods, including throwsters	.850	.985	.945	.935	.800	.800	.750
Knit goods	.850	.985	.945	.935	.800	.800	.750
Clothing, men's	.850	.985	.945	.935	.780	.820	.750
Boots and shoes, not including rubber boots and shoes	.865	.945	.915	.895	.855	.875	.820
Automobiles	.930	.964	.900	.755	.800	.675	.680
Iron and steel, steel works and rolling mills	.780	.894	.870	.860	.875	.735	.750
Cars, steam-railroad	.485	.555	.575	.510	.740	.625	.630
Paper and wood pulp	.930	1.000	.970	.950	1.030	.970	.910
Tobacco, cigars and cigarettes	.775	.810	.845	.815	.895	.830	.740
Leather, tanned, curried, and finished	.815	.890	.860	.845	.760	.835	.730

[10] There are also given in Table 153 two or three special series of employment indices and ratios of actual to full employment; two series for cotton, one based on the regression method and the other based on employment data for cotton in Massachusetts; and two series based on employment data for the States of Massachusetts and New Jersey.

we are studying it has not been necessary to compute employment ratios, since the interpolated figures for intercensal years are based on State data on actual annual earnings per capita.

RELIABILITY OF THE RATIOS

Before leaving this description of the procedure for deriving the series of fractions of full employment, something should be said regarding the reliability of these ratios. This can be done after a fashion, by comparing the ratios obtained with the census figures reported in the 1904 census for the number of days factories were in operation. The weighted averages which can be calculated from the frequency distributions in the census reports (when divided by the 307 days which constitute a full year's work) probably would represent in percentage form what is no doubt somewhere near the proportion of actual to full employment. Since employees lose more or less time even when the factories are in operation, and since this lost time is probably not made up by the amount of overtime put in, a proportion which is somewhat too high results; that is to say, the actual fraction of full employment would be, somewhat, but not greatly, lower than the ratios computed by dividing the weighted average of days in operation by the number of days in the full-time year.

The weighted average number of days in operation in 1904, derived from the census figures for "all industries" combined, is 262. This figure divided by 307 gives a ratio of 0.855. The estimated ratio of actual to full employment for "all industries," obtained by taking the mean of corresponding ratios calculated by Methods A and B, respectively, is 81.9 per cent for 1904. In view of the probable exaggeration in the census weighted average of 0.855 it would appear that at least for "all industries" combined, the present estimated ratios are fairly accurate.

More satisfactory checks on the accuracy of the ratios actual to full employment are available in the last two columns of Table 148. These columns contain (1) Hornell Hart's estimates (1902–1917) of "the percentage employed of the normal supply of nonagricultural workers," and (2) (for 1907–1922) the ratio of the average number of employees at work to the average number attached to the industry, as estimated by the National Bureau of Economic Research. It will be noticed, first of all, that there is a very close correspondence between the estimates both of Mr. Hart and the National Bureau, on the one hand, and the present Method B series, on the other.

Despite this fact, it is believed that the average of series A and B, and not series B alone, is the more accurate. The reason for this lies, chiefly, in the fact that neither of the series brought in here for

comparison with the one constructed in this monograph seems to take any account of time lost by employees *while on the pay roll* through part-time employment and time lost in waiting, etc. Mr. Hart and the National Bureau both report, so it appears, only time lost by reason of wage earners going off the pay roll. We are in quest of ratios which will facilitate the determination of the per capita earnings of all wage earners attached to manufacturing industry. This requires the inclusion in the reduction of full to actual time, of all uncompensated time lost by employees while on the pay roll.

There is evidence that the amount of this underemployment is great enough to account for quite all of the margin between the final series in the fourth column of Table 148, on the one hand, and Mr. Hart's series, the National Bureau's series and series B, on the other. It has been estimated that partial or underemployment "is responsible for loss of about 10 per cent more of the working time of industrial wage earners," and that sickness or other disability add 2½ per cent more.[11] These items are to be added to the 10 per cent of time lost by unemployment proper.

We are now ready to apply the ratios of actual to full employment to the full-time earnings figures shown in earlier sections of this monograph. The manner in which this is done is indicated in Table 155, which shows for all industries combined, the estimated annual, full-time earnings, per capita, for each year during the period under review. The ratio of actual to full employment and the estimated actual money earnings are obtained by multiplying the figures in the first column by the ratios in the second column, and it is after this fashion that all of the figures showing estimated actual money earnings, per capita, throughout the book, are derived.

TABLE 155.—DERIVATION OF ACTUAL FROM FULL-TIME EARNINGS, PER CAPITA, ALL INDUSTRIES COMBINED

YEAR	Estimated full-time earnings per capita	Ratio, actual to full employment	Estimated actual earnings per capita	YEAR	Estimated full-time earnings per capita	Ratio, actual to full employment	Estimated actual earnings per capita
1899	$525	0.849	$446	1913	$712	0.866	$617
1900	544	.825	449	1914	719	.801	576
1901	552	.854	471	1915	732	.831	608
1902	566	.878	497	1916	846	.908	768
1903	579	.860	498	1917	980	.878	860
1904	590	.819	483	1918	1,284	.860	1,104
1905	602	.891	536	1919	1,433	.846	1,212
1906	626	.908	568	1920	1,722	.864	1,488
1907	650	.891	579	1921	1,462	.716	1,047
1908	643	.772	496	1922	1,424	.822	1,171
1909	643	.866	557	1923	1,566	.905	1,317
1910	654	.854	559	1924	1,560	.840	1,310
1911	662	.807	534	1925	1,582	.886	1,402
1912	684	.866	592				

[11] U. S. Bureau of Labor Statistics Bull. 310, p. 2. See also chapter on "Under employment" in Business Cycles and Unemployment, by W. C. Mitchell and others.

TABLE 156.—FINAL EMPLOYMENT INDEX, FOR CENSUS YEARS, WITH CORRESPONDING FRACTIONS OF FULL EMPLOYMENT CALCULATED BY METHOD A

INDUSTRY	EMPLOYMENT INDEX IN CENSUS YEARS (NORMAL=100)							Estimated fractions of full employment in 1921	ESTIMATED FRACTIONS OF FULL EMPLOYMENT (METHOD A)[1]						
	1899	1904	1909	1914	1919	1921	1923		1899	1904	1909	1914	1919	1921	1923
All industries	1.003	0.968	1.024	0.947	1.000	0.846	1.070	0.658	0.780	0.753	0.796	0.736	0.778	0.658	0.832
Food, beverages, and tobacco	.959	.994	.987	.973	1.036	.966	1.034	.735	.730	.756	.751	.740	.788	.735	.787
Food and kindred products	.893	.956	1.001	.931	1.036	.931	1.001	------	.705	.756	.790	.735	.818	.735	.790
Bread and other bakery products	.931	1.029	1.043	.959	1.036	.952	.973	------	.719	.795	.805	.741	.800	.735	.751
Flour-mill and gristmill products	.931	1.029	1.043	.959	1.036	.952	.973	------	.719	.795	.805	.741	.800	.735	.751
Confectionery	.966	.945	.987	1.008	1.036	.945	.980	------	.751	.735	.767	.784	.806	.735	.762
Slaughtering and meat packing	.910	.959	.931	.882	1.036	.889	1.043	------	.752	.793	.769	.729	.856	.735	.862
Liquors and beverages	.987	1.036	.966	1.008	1.036	.881	1.108	------	.823	.864	.806	.841	.864	.735	.924
Liquors, malt	1.008	1.036	1.008	1.014	1.036	.881	1.108	------	.841	.864	.841	.846	.864	.735	.924
Mineral and soda waters	.987	1.036	.966	1.008	1.036	.881	1.108	------	.823	.864	.806	.841	.864	.735	.924
Tobacco manufactures	1.029	1.036	1.022	1.022	1.036	1.015	1.042	------	.745	.750	.740	.740	.750	.735	.755
Tobacco, cigars and cigarettes	1.029	1.036	1.022	1.022	1.036	1.015	1.042	------	.745	.750	.740	.740	.750	735	.755
Textiles, garments, and leather	1.030	1.017	1.073	1.039	1.005	.963	1.074	.790	.845	.834	.880	.852	.824	.790	.881
Textiles and their products	1.030	1.017	1.073	1.039	1.005	.963	1.074	------	.845	.834	.880	.852	.824	.790	.881
Carpets and rugs, other than rag	1.030	1.017	1.073	1.039	1.005	.963	1.074	------	.845	.834	.880	.852	.824	.790	.881
Shirts	1.030	1.017	1.073	1.039	1.005	.963	1.074	------	.845	.834	.880	.852	.824	.790	.881
Clothing, men's	1.030	1.017	1.073	1.039	1.005	.963	1.074	------	.845	.834	.880	.852	.824	.790	.881
Clothing, women's	1.030	1.017	1.073	1.039	1.005	.963	1.074	------	.845	.834	.880	.852	.824	.790	.881
Cotton manufactures	1.012	.987	1.017	1.017	1.005	.976	1.017	------	.819	.799	.823	.823	.814	.790	.823
Dyeing and finishing textiles, exclusive of that done in textile mills	1.030	1.017	1.073	1.039	1.005	.963	1.074	------	.845	.834	.880	.852	.824	.790	.881
Knit goods	1.030	1.017	1.073	1.039	1.005	.963	1.074	------	.845	.834	.880	.852	.824	.790	.881
Silk goods, including throwsters	1.030	1.017	1.073	1.039	1.005	.963	1.074	------	.845	.834	.880	.852	.824	.790	.881
Woolen and worsted goods	.912	1.072	1.190	1.063	1.005	1.038	1.173	------	.694	.816	.906	.809	.765	.790	.893
Worsted goods	.912	1.072	1.190	1.063	1.005	1.038	1.173	------	.694	.816	.906	.809	.765	.790	.893
Leather and its finished products	.991	.957	1.011	.937	1.005	.890	1.121	------	.879	.849	.897	.831	.892	.790	.995
Boots and shoes, not including rubber boots and shoes	.998	.964	1.018	.944	1.005	.904	1.011	------	.872	.843	.890	.825	.878	.790	.884
Leather, tanned, curried, and finished	.991	.957	1.011	.937	1.005	.884	1.226	------	.886	.855	.903	.837	.898	.790	1.096

Lumber and timber products	1.000	.993	1.015	.952	1.015	.931	1.154	.733	.787	.782	.799	.750	.799	.733	.909
Lumber and timber products	1.000	.993	1.015	.952	1.015	.931	1.154	------	.787	.782	.799	.750	.799	.733	.909
Furniture	1.000	.993	1.015	.952	1.015	.931	1.154	------	.787	.782	.799	.750	.799	.733	.909
Lumber, timber products	1.000	.993	1.015	.952	1.015	.931	1.154	------	.787	.782	.799	.750	.799	.733	.909
Lumber, planing-mill products, not including planing mills connected with sawmills	1.000	.993	1.015	.952	1.015	.931	1.154	------	.787	.782	.799	.750	.799	.733	.909
Paper and printing	1.024	.994	1.043	.977	1.043	.971	1.226	.883	.931	.904	.948	.888	.948	.883	1.115
Paper and printing	1.024	.994	1.043	.977	1.043	.971	1.226	------	.931	.904	.948	.888	.948	.883	1.115
Paper and wood pulp	1.036	1.006	1.055	.989	1.043	.930	1.131	------	.984	.955	1.002	.939	.991	.883	1.074
Printing and publishing, book and job	1.018	.988	1.037	.971	1.043	1.013	1.102	------	.888	.861	.904	.847	.909	.883	.961
Printing and publishing, newspapers and periodicals	1.018	.988	1.037	.971	1.043	1.013	1.102	------	.888	.861	.904	.847	.909	.883	.961
Stone, clay, glass, and chemicals	1.000	1.041	1.048	.979	1.035	.881	1.104	.789	.895	.932	.938	.876	.927	.789	.988
Chemicals and allied products	1.028	1.056	1.028	1.014	1.035	.881	1.104	------	.920	.945	.920	.908	.927	.789	.988
Chemicals	1.028	1.056	1.028	1.014	1.035	.881	1.104	------	.920	.945	.920	.908	.927	.789	.988
Petroleum refining	1.279	1.049	1.020	1.049	1.035	.881	1.104	------	1.145	.939	.913	.939	.927	.789	.988
Stone, clay, and glass products	.970	1.035	1.063	.937	1.035	.881	1.104	------	.868	.927	.952	.839	.927	.789	.988
Brick and tile, terra-cotta, and fire-clay products	.881	.986	1.028	.902	1.035	.881	1.104	------	.789	.883	.920	.808	.927	.789	.988
Glass	1.028	.979	.923	1.007	1.035	.881	1.104	------	.920	.876	.826	.902	.927	.789	.988
Metals, vehicles, railroad cars, and miscellaneous	.961	.928	1.012	.928	.984	.720	1.073	.519	.693	.669	.730	.669	.709	.519	.774
Iron and steel and their products	.995	.917	1.012	.860	.984	.720	1.073	------	.717	.661	.730	.620	.709	.519	.774
Iron and steel, blast furnaces	.995	.917	1.012	.860	.984	.720	1.073	------	.717	.661	.730	.620	.709	.519	.774
Iron and steel, steel works and rolling mills	.995	.917	1.012	.860	.984	.720	1.073	------	.717	.661	.730	.620	.709	.519	.774
Foundry and machine-shop products	.993	.924	1.008	.875	.984	.751	1.063	------	.686	.639	.697	.605	.680	.519	.735
Metals and metal products, other than iron and steel	1.000	.984	1.012	.944	.984	.720	1.073	------	.721	.709	.730	.681	.709	.519	.774
Brass, bronze, and copper products	1.000	.984	1.012	.944	.984	.720	1.073	------	.721	.709	.730	.681	.709	.519	.774
Smelting and refining	1.000	.984	1.012	.944	.984	.720	1.073	------	.721	.709	.730	.681	.709	.519	.774
Vehicles for land transportation	.911	.894	1.017	.989	.984	.720	1.073	------	.657	.645	.733	.713	.709	.519	.774
Automobile bodies and parts	.989	.939	1.028	1.000	.984	.720	1.073	------	.713	.677	.741	.721	.709	.519	.774
Automobiles	.989	.939	1.028	1.000	.984	.720	1.073	------	.713	.677	.741	.721	.709	.519	.774
Cars, steam-railroad	.894	.810	.855	.872	.984	.720	1.073	------	.645	.584	.616	.629	.709	.519	.774
Railroad repair shops	.961	.928	1.012	.928	.984	.720	1.073	------	.693	.669	.730	.669	.709	.519	.774
Railroad repair shops—electric	.961	.928	1.012	.928	.984	.720	1.073	------	.693	.669	.730	.669	.709	.519	.774
Railroad repair shops—steam	.961	.928	1.012	.928	.984	.720	1.073	------	.693	.669	.730	.669	.709	.519	.774
Miscellaneous implements	.942	.901	1.004	.901	.984	.830	1.053	------	.589	.563	.628	.563	.615	.519	.659
Agricultural implements	.942	.901	1.004	.901	.984	.830	1.053	------	.589	.563	.628	.563	.615	.519	.659
Rubber tires, tubes, and rubber goods	.942	.901	1.004	.901	.984	.830	1.053	------	.589	.563	.628	.563	.615	.519	.659
Shipbuilding, steel	.942	.901	1.004	.901	.984	.830	1.053	------	.589	.563	.628	.563	.615	.519	.659
Electrical machinery, apparatus, and supplies	.942	.901	1.004	.901	.984	.830	1.053	------	.589	.563	.628	.563	.615	.519	.659

[1] $\left(\frac{.658 \times 1.000}{.846} = .778$ for 1919). Other years calculated by multiplying 1919 ratio by employment index for each year in turn.

TABLE 157.—ESTIMATED FRACTIONS OF FULL EMPLOYMENT, METHOD B, WITH EMPLOYMENT INDEXES IN THE PEAK YEAR FOR THE INDUSTRIES AND GROUPS OF INDUSTRIES

INDUSTRY	Peak year of employment index	Employment index in peak year	Ratio: actual to full employment in peak year	ESTIMATED RATIOS, ACTUAL TO FULL EMPLOYMENT IN CENSUS YEARS (METHOD B)					
				1899	1904	1909	1914	1919	1923
All industries	1916	1.073	0.88+	0.847	0.886	0.926	0.886	0.8++	0.775	0.875
Food, beverages, and tobacco	1919	1.036	.879	.906	.889	.933	.915	.979	.915	.947
Food and kindred products	1916	1.049	.....	.855	.862	.894	.869	.967	.902	.924
Bread and other bakery products	1906	1.139	.....	.776	.847	.876	.794	.859	.776	.861
Flour-mill and gristmill products	1906	1.190	.....	.776	.847	.876	.794	.859	.776	.861
Confectionery	1923	1.121	.....	.800	.782	.841	.794	.858	.782	.821
Slaughtering and meat packing	1918	1.048	.....	.843	.883	.903	.921	.961	.923	.973
Liquors and beverages	1917	1.111	.....	.868	.911	.934	.907	.961	.911	.973
Liquors, malt	1917	1.206	.....	.861	.905	.931	.896	.956	.905	.973
Mineral and soda waters	1923	1.115	.....	.889	.912	.930	.902	.952	.912	.963
Tobacco manufactures	1920	1.119	.....	.900	.902	.934	.894	.947	.898	.953
Tobacco, cigars and cigarettes	1920	1.119	.....	.900	.902	.934	.894	.947	.898	.953
Textiles, garments, and leather	1916	1.212	.960	.913	.878	.928	.911	.974	.878	.940
Textiles and their products	1916	1.212	.....	.913	.878	.928	.911	.974	.878	.940
Carpets and rugs, other than rag	1916	1.212	.....	.913	.878	.928	.911	.974	.878	.940
Shirts	1916	1.226	.....	.913	.878	.928	.911	.974	.878	.940
Clothing, men's	1916	1.226	.....	.913	.878	.928	.911	.974	.878	.940
Clothing, women's	1916	1.226	.....	.913	.878	.928	.911	.974	.878	.940
Cotton manufactures	1917	1.079	.....	.903	.892	.943	.907	.966	.917	.947
Dyeing and finishing textiles, including print works and bleacheries	1916	1.212	.....	.913	.878	.928	.911	.974	.878	.940
Knit goods	1916	1.212	.....	.913	.878	.928	.911	.974	.878	.940
Silk goods, including throwsters	1916	1.226	.....	.913	.878	.928	.911	.974	.878	.940
Woolen and worsted goods	1918	1.169	.....	.907	.874	.928	.878	.968	.884	.947
Worsted goods	1918	1.162	.....	.907	.874	.928	.906	.968	.884	.947
Leather and its finished products	1920	1.121	.....	.946	.929	.962	.962	.980	.962	.980
Boots and shoes, not including rubber boots and shoes	1916	1.060	.....	.939	.909	.947	.961	.976	.923	.941
Leather, tanned, curried, and finished	1920	1.226	.....	.776	.749	.792	.774	.787	.802	.980
Lumber and timber products	1923	1.134	.806	.828	.821	.846	.778	.940	.777	.866
Lumber and timber products	1923	1.134	.....	.828	.821	.846	.778	.940	.777	.866
Furniture	1923	1.134	.....	.828	.821	.846	.778	.940	.777	.866
Lumber, timber products	1923	1.134	.....	.828	.821	.846	.778	.940	.777	.866
Lumber, planing mill products, not including logging camps and sawmills	1923	1.134	.....	.828	.821	.846	.778	.940	.777	.866
Paper and printing	1923	1.226	.967	.824	.800	.840	.786	.940	.782	.867
Paper and printing	1923	1.226	.....	.824	.800	.840	.786	.940	.782	.867
Paper and wood pulp	1923	1.151	.....	.808	.779	.821	.782	.941	.781	.867
Printing and publishing, book and job	1923	1.102	.....	.842	.805	.829	.870	.935	.808	.867
Printing and publishing, newspapers and periodicals	1923	1.102	.....	.842	.805	.829	.870	.935	.808	.867
Stone, clay, and glass products	1923	1.104	.980	.867	.844	.886	.877	.940	.798	.844
Chemicals and allied products	1923	1.201	.....	.847	.870	.847	.888	.923	.788	.911
Chemicals	1923	1.202	.....	.847	.870	.847	.888	.923	.788	.911
Petroleum refining	1909	1.278	.....	.900	.851	.928	.851	.951	.882	.894
Stone, clay, and glass products	1923	1.104	.....	.871	.828	.864	.840	.959	.792	.828
Brick and tile, cements and fire-clay products	1923	1.219	.....	.790	.873	.899	.796	.916	.767	1.000
Glass	1923	1.181	.....	.881	.826	.873	.844	.967	.772	.823

* The type of bar used is marked by average earnings which as per cent of the peak number is 100. For explanation of term see footnote 1, p. 10. This information also, that is, data relative to earnings, is presented in a less complete form in the following table, but proportion of full employment at this rate.

TABLE 157.—ESTIMATED FRACTIONS OF FULL EMPLOYMENT (METHOD B), WITH EMPLOYMENT INDEXES IN THE PEAK YEAR FOR THE INDUSTRIES AND GROUPS OF INDUSTRIES—Continued

INDUSTRY	Peak year of employment index	Employment index in peak year	Ratio actual to full employment in peak year	ESTIMATED RATIOS, ACTUAL TO FULL EMPLOYMENT IN CENSUS YEARS (METHOD B)						
				1899	1904	1909	1914	1919	1921	1923
Metals, vehicles, railroad cars, and miscellaneous	1916	1.163	0.997	0.824	0.794	0.867	0.794	0.843	0.617	0.920
Iron and steel and their products	1916	1.096	------	.905	.834	.921	.783	.895	.655	.976
Iron and steel, blast furnaces	1916	1.096	------	.905	.834	.921	.783	.895	.655	.976
Iron and steel, steel works and rolling mills	1916	1.096	------	.905	.834	.921	.783	.895	.655	.976
Foundry and machine-shop products	1916	1.083	------	.915	.851	.928	.806	.906	.692	.979
Metals and metal products, other than iron and steel	1916	1.185	------	.841	.828	.851	.794	.828	.606	.902
Brass, bronze, and copper products	1916	1.185	------	.841	.828	.851	.794	.828	.606	.902
Smelting and refining	1916	1.185	------	.841	.828	.851	.794	.828	.606	.902
Vehicles for land transportation	1907	1.247	------	.729	.715	.814	.791	.787	.576	.858
Automobile bodies and parts	1916	1.292	------	.764	.725	.794	.772	.760	.556	.828
Automobiles	1916	1.292	------	.764	.725	.794	.772	.760	.556	.828
Cars, steam-railroad	1907	1.510	------	.590	.535	.564	.576	.649	.475	.708
Railroad repair shops	1916	1.163	------	.824	.795	.867	.795	.843	.617	.920
Railroad repair shops—electric	1916	1.163	------	.824	.795	.867	.795	.843	.617	.920
Railroad repair shops—steam	1916	1.163	------	.824	.795	.867	.795	.843	.617	.920
Miscellaneous	1916	1.194	------	.787	.752	.838	.752	.822	.693	.879
Agricultural implements	1916	1.194	------	.787	.752	.838	.752	.822	.693	.879
Rubber goods	1916	1.194	------	.787	.752	.838	.752	.822	.693	.879
Shipbuilding, steel	1916	1.194	------	.787	.752	.838	.752	.822	.693	.879
Electrical machinery, apparatus, and supplies	1916	1.194	------	.787	.752	.838	.752	.822	.693	.879

Chapter XVII

DEFLATION OF MONEY EARNINGS

The figures which emerge after making the adjustments described in the last two chapters are money earnings. They have been reduced, it is true, from a hypothetical full-time sum to a more realistic "actual" sum which represents what wage earners actually receive and have to live on during each successive year. They remain, so far, nominal wages; that is to say, they represent the number of dollars received every year. Now, it is a matter of common knowledge that in some years our dollars will buy much more than they will buy in other years, the reason being, of course, that prices have fallen; conversely, a rise in prices, with wage rates and the amount of employment remaining constant, again will bring about a reduction in the quantities of goods and services the worker can buy with his earnings. These ups and downs in prices are partly responsible, then, for successive falls and rises in the purchasing power of wages or earnings. For some purposes earnings expressed in current dollars have value. Money, however, is not an end in itself. Money earnings are not ends in themselves. They are the necessary means for the purchase of the necessities, comforts, and luxuries, needed or desired by wage earners. Consequently, the consideration of primary importance in any study of earnings is the determination of the changes in the amounts of goods (food, clothing, housing, etc.) which the wage earner is able to buy with his year's income. Naturally, if there is no change in prices, statistics of money earnings will suffice to show changes in amounts of goods which can be bought from year to year, and will completely serve our purpose of indicating year-to-year changes in the purchasing power of wage earners' incomes. In other words, if the general level of prices, especially the prices of articles of such food, clothing, and housing as are bought by wage earners, do not change, then the purchasing power of their actual earnings from year to year is faithfully reflected, without further adjustment, by the sums they are estimated to have received in current dollars.

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During the period represented in this monograph there have taken place, however, very large changes in prices. For the most part, these changes have taken the form of price increases. Indeed,

the only part of the period during which there has been any considerable fall in prices is the period since 1920, the peak year of retail prices in the quarter century under review. And since 1920, although a decline has occurred, the fall in prices has not been sufficiently great to bring prices back at all close to the pre-war level. The period of increasing prices is marked by a gradual rise from 1899 to 1915 and by a very marked rise during the war period extending through the six-year term from 1915 to 1920.[1]

THE PROCESS OF DEFLATION

The process of deflating the money earnings by use of cost of living indexes is relatively simple. In general, it is accomplished by merely dividing the amount of money wages at any given time and for any given class of workers by the index number of the cost of living for that year. The resulting figure represents the purchasing power of the original money earnings in terms of the purchasing power of the dollar in the year taken as the base for the cost of living index. In this inquiry that base is the year 1914. Similarly, an index number of "real" wages can be obtained by dividing the index number of money wages for any year and region by the index number of the cost of living for that year.

The cost of living index series used as a deflator in the present analysis is one based primarily upon statistics of food and living costs published by the United States Bureau of Labor Statistics. This bureau publishes two series of figures that relate to changes in the cost of living: One is a monthly index, running back to 1890, of the prices of food at retail; the other is an index of the total cost of living, begun in 1913 and now published semiannually.

The food index is based upon actual selling prices received by the bureau from retail dealers. "The number of articles included in the index number for each year" the bureau reports [2] "has not been the same throughout the period, but a sufficient number have been used fairly to represent food as a whole. From 1890 to 1907, thirty articles were used; from 1907 to 1913, fifteen articles; from 1913 to 1920, twenty-two articles; and from 1921, forty-three articles. The relatives for the period have been so computed as to be comparable with each other." Assuming that the composition of this food-cost index is such as "fairly to represent food as a whole," [3] there yet remains a question of the adequacy of a food-cost index faithfully to

[1] See fig. 8, p. 62.

[2] Labor Review, February, 1928, p. 173.

[3] The only part of the period as to which there may be doubt of the adequacy of the bureau's index to reflect fluctuations in food costs is the period from 1907 to 1913 when the index contained only 15 commodities. For a discussion of this point, see Douglas, Paul H., Real Wages (Pollak Foundation for Economic Research).

reflect changes in the total cost of living. Since food makes up a large proportion of the disbursements of wage earners families and since changes in living costs other than food costs tend in a rough way to fluctuate with food costs, it follows that for most periods a food-cost index will indicate fairly closely the changes that occur in living cost as a whole. Yet there are abnormal periods (and such periods are included in the quarter-century surveyed in this book) when the disproportionately rapid change taking place, say, in rents, makes entirely misleading any index that does not include the price of housing.

The cost of living index is based upon actual prices secured semi-annually from merchants and dealers in 32 representative cities throughout the country. The bureau makes the following explanation of the method followed in collecting its cost of living data:

The prices of food and of fuel and light (which include coal, wood, gas, electricity, and kerosene) are furnished the bureau in accordance with arrangements made with establishments through personal visits of the bureau's agents. In each city food prices are secured from 15 to 25 merchants and dealers, and fuel and light prices from 10 to 15 firms, including public utilities. All other data are secured by special agents of the bureau who visit the various merchants, dealers, and agents and secure the figures directly from their records. Four quotations are secured in each city (except in Greater New York, where five are obtained) on each of a large number of articles of clothing, furniture, and miscellaneous items. The number of houses and apartments for which basic rental figures are shown vary in the different cities approximately in proportion to population, the number per city, in round numbers, ranging from 400 to 2,200.[4]

Unfortunately, this index which, unquestionably, is well adapted for use as a deflator of money earnings, dates only from 1914. In this situation the first expedient relied upon was the consolidation, by splicing at 1914, of the food index with the total cost of living index. The resulting spliced index proved unsatisfactory, because of the inadequacy of the food index as an indicator of total living costs. Food costs, or at any rate the articles of food included in the official food-cost index, increased more rapidly, between 1899 and 1914, than did other living costs. The result was greatly to exaggerate the downward drift of real earnings during that period. Indeed, the index numbers of real earnings in Chapter IX seem to justify the statement that the effect of the use of the food-cost index would be not so much to "exaggerate the downward drift" as to produce the appearance of such a drift when, actually, pre-war real wages ran along a somewhat bumpy level. The real wage index shown in the analysis which this book reports is 105 for 1899, 108 for 1902, 101

[4] Labor Review, February, 1928, p. 218.

for 1904, 115 for 1906, 99 for 1908, 98 for 1911, and 100 for 1914. An added reason for the rejection of the spliced index is the fact that, between 1907 and 1913, the Federal bureau's food index was much overloaded with meats, the prices of which advanced more rapidly at that time than did most other articles of food.[5]

Fortunately there has become available a competent revision of the food index of the Bureau of Labor Statistics—a revision designed through an expansion of its scope to make it more truly reflective of changes in the total cost of living than is the unrevised series.[6] It is this modified Bureau of Labor Statistics food index that has been used in the present analysis as a deflator of money earnings. In Table 158 a comparison is made between the results of the use of the crude and the revised indexes.

TABLE 158.—COMPARISON OF RESULTS OF APPLICATION TO ESTIMATED AMOUNTS OF MONEY EARNINGS OF THE INDEX OF FOOD COSTS OF THE UNITED STATES BUREAU OF LABOR STATISTICS WITH AND OF THE REVISED FOOD INDEX

YEAR	COST OF LIVING INDEXES 1914=100		INDEX NUMBERS OF REAL EARNINGS BASED ON INDEX		YEAR-TO-YEAR PER CENT OF CHANGE IN REAL EARNINGS, PER CAPITA, DERIVED FROM INDEX		PERIOD
	Original food index	Revised index					
	A	B	A	B	A	B	
1899	67	74	116	105			
1900	67	76	116	103	0	−2	1899–1900
1901	70	78	117	105	1	2	1900–1901
1902	73	80	119	108	2	3	1901–1902
1903	73	84	119	103	0	−4	1902–1903
1904	75	83	112	101	−6	−2	1903–1904
1905	75	83	125	112	12	11	1904–1905
1906	77	86	129	115	3	3	1905–1906
1907	80	91	126	110	−2	−3	1906–1907
1908	82	87	106	99	−16	−11	1907–1908
1909	93	87	104	111	−2	12	1908–1909
1910	90	92	108	106	4	−4	1909–1910
1911	89	95	104	98	−4	−8	1910–1911
1912	95	96	108	107	4	9	1911–1912
1913	97	99	110	108	2	1	1912–1913
1914	100	100	100	100	−9	−8	1913–1914

It appears from these figures that the crude index would, if used, have underestimated living costs between 1899 and 1905 and overestimated living costs between 1899 and 1905 and overestimated the costs, especially the rise in costs, between 1906 and 1909; between 1910 and 1914 there is an appreciable difference only in 1911, for which year the crude index evidently would have underestimated living costs.

[5] The writer is indebted, for notice of this point, to Prof. Paul H. Douglas, of the University of Chicago. The subject is discussed by him at some length in his forthcoming book on Real Wages.

[6] "The Movement of Real Wages and Its Economic Significance," by P. H. Douglas, American Economic Review, Supplement, March, 1926, pp. 22-24. Professor Douglas has kindly consented to the use of his revised series in this monograph. Professor Douglas's revision runs only to 1924; for subsequent years the writer has used the figures for total cost of living as reported by the Bureau of Labor Statistics.

The result is that estimates based on the crude index would indicate a greater fall in real earnings from 1899 to 1914, than, in all probability, actually took place: The latter year, by the revised index, is only 5 points below 1899; by the crude index it is 16 points below 1899. A further result of the use of the crude index is that the gain in per capita real earnings for the whole quarter-century period would be underestimated; by the crude index it appears that between 1899 and 1924 real earnings increased 15 per cent; by the revised index they appear to have increased 27 per cent. The revised cost of living index, as used in foregoing chapters, is presented in Table 159. All of the figures have been shifted to the 1914 base.

TABLE 159.—ANNUAL INDEX OF THE COST OF LIVING IN THE UNITED STATES 1899–1927

YEAR	Index, 1914=1.000	YEAR	Index, 1914=1.000	YEAR	Index, 1914=1.000	YEAR	Index, 1914=1.000
1899	0.74	1907	0.91	1915	0.98	1923	1.69
1900	.76	1908	.87	1916	1.07	1924	1.69
1901	.78	1909	.87	1917	1.29	1925	1.70
1902	.80	1910	.92	1918	1.57	1926	1.73
1903	.84	1911	.95	1919	1.79	1927	1.71
1904	.83	1912	.96	1920	2.05		
1905	.83	1913	.99	1921	1.76		
1906	.86	1914	1.00	1922	1.66		

The method of applying the cost of living indexes in the deflation of earnings is illustrated in Table 160, which shows, for all industries combined and for the United States as a whole, the estimated actual money earnings per capita, the cost of living index, and the purchasing power of estimated actual money earnings, per capita, for each census year from 1899 to 1927.

TABLE 160.—ILLUSTRATION OF METHOD OF DEFLATING MONEY WAGES

YEAR	Estimated money earnings, per capita	Cost of living index	Estimated real earnings, per capita	YEAR	Estimated money earnings, per capita	Cost of living index	Estimated real earnings, per capita
1899	$446	0.74	$603	1914	$576	1.00	$576
1900	449	.76	591	1915	608	.98	620
1901	471	.78	604	1916	768	1.07	718
1902	497	.80	621	1917	860	1.29	667
1903	498	.84	593	1918	1,104	1.57	703
1904	483	.83	582	1919	1,212	1.79	677
1905	536	.83	646	1920	1,488	2.05	726
1906	568	.86	660	1921	1,047	1.76	595
1907	579	.91	636	1922	1,171	1.66	705
1908	496	.87	570	1923	1,317	1.69	839
1909	557	.87	640	1924	1,310	1.69	776
1910	559	.92	608	1925	1,402	1.70	825
1911	534	.95	562	1926	1,436	1.73	830
1912	592	.96	617	1927	1,373	1.71	805
1913	617	.99	623				

Chapter XVIII

ESTIMATION OF AVERAGE HOURS WORKED PER WEEK AND OF AVERAGE HOURLY EARNINGS

As has been stated in an earlier chapter, any discussion in these pages of hourly wage rates or earnings must be strictly incidental and supplementary to the main body of the report, which deals with annual earnings. Not only the results already presented, but in no less degree the procedure by which these results have been worked out and which is about to be explained are entirely independent of the method of analysis described in the chapters immediately preceding. Obviously, the very fact that materials and methods relating to hourly earnings are independent of other parts of this analysis, gives the resulting estimates of hourly earnings an added value for checking up our estimates of annual earnings.

The estimated hourly earnings reported in Parts II and III of this monograph are computed by dividing the estimated full-time weekly earnings for each census year (derived by expansion of average weekly earnings shown for 1904 in Census Bulletin 93 and application to this expanded average of the scale of relatives of census average wages)[1] by the average full-time hours worked per week in each different industry or geographic jurisdiction. The details of the method of arriving at the first factor in making this division, namely, the estimated full-time weekly earnings, have already been set out in another place. In this chapter it remains to explain the method of arriving at estimates of average full-time hours per week and average earnings per hour.

CENSUS DATA ON PREVAILING HOURS OF LABOR

Unfortunately, the Census Bureau does not show, as such, the average number of hours worked per week in different census years. It does, however, present material from which an average may be computed, namely, frequency tables in the form of percentage distributions of the numbers of employees in establishments in which the prevailing hours of labor per week fall within certain classified limits. The Census Bureau presents this material completely classified by industries and by geographic divisions. Table 164, taken from the report of the Census of Manufactures, 1921,[2] shows the form in which the material is regularly presented by the census.

[1] See initial paragraph of Ch. XIII, p. 269.

[2] Report, Census of Manufactures, 1921, p. 68.

TABLE 161.—AVERAGE NUMBER OF WAGE EARNERS, DISTRIBUTED ACCORDING TO PREVAILING HOURS OF LABOR, FOR ALL INDUSTRIES COMBINED, FOR THE UNITED STATES: 1921, 1919, AND 1914

PREVAILING HOURS OF LABOR PER WEEK	1921	1919 [1]	1914 [1]	PER CENT DISTRIBUTION		
				1921	1919	1914
Total	[2] 6,946,570	9,096,372	7,034,247	100.0	100.0	100.0
44 and under	954,908	1,111,107	----------	13.7	12.2	----------
Between 44 and 48	293,111	346,179	----------	4.2	3.8	----------
48 [3]	2,334,256	2,961,407	833,330	33.6	32.6	11.9
Between 48 and 54	1,262,071	1,496,177	945,735	18.2	16.4	13.4
54	542,581	828,353	1,818,390	7.8	9.1	25.8
Between 54 and 60	871,961	1,248,854	1,543,018	12.6	13.7	21.9
60	516,520	827,745	1,487,801	7.4	9.1	21.1
Over 60	171,162	276,550	407,973	3.6	3.0	5.8

[1] Includes data for "automobile-repairing" industry as follows: For 1919, total wage earners, 55,061; 44 and under, 3,116; between 44 and 48, 282; 48, 13,014; between 48 and 54, 6,027; 54, 17,051; between 54 and 60, 2,938; 60, 11,742; over 60, 891. For 1914, total wage earners, 12,562; 48 and under, 1,607; between 48 and 54, 1,050; 54, 5,830; between 54 and 60, 1,220; 60, 2,477; over 60, 378.
[2] Not including 40,924 wage earners in establishments reporting products valued at less than $5,000.
[3] Includes 48 and under for 1914.

The census statistics corresponding to the material shown in Table 164, and covering all census years from 1899 to 1921, inclusive, have been rearranged with the classification brackets expanded or contracted, as the case may be, in order to make all census years during that period mutually comparable with each other. The consolidated distributions are shown in Table 165. The second column lists the assumed midpoints of the different groups, points which are used in the calculation of the weighted averages. Such points were assumed not only for all industries combined but also for similar distributions for each of the 41 selected industries and 9 geographic divisions, for the purpose of calculating the average number of hours worked per

TABLE 162.—AVERAGE NUMBER OF WAGE EARNERS, DISTRIBUTED ACCORDING TO PREVAILING HOURS OF LABOR PER WEEK, ALL INDUSTRIES COMBINED, CENSUS YEARS: 1909–1921

PREVAILING HOURS OF LABOR PER WEEK	Midpoints used in making the average	1909	1914	1919	1921
Total	----------	6,615,046	7,036,247	9,096,372	6,946,570
44 and under	42	----------	----------	1,111,107	954,908
44 to 48	46	----------	----------	346,179	293,111
48 and under	46	523,652	833,330	----------	----------
48	48	----------	----------	2,961,407	2,334,256
48 to 54	50	481,157	945,735	1,496,177	1,262,071
54	54	1,019,438	1,818,390	828,353	542,581
54 to 60	56	1,999,307	1,543,018	1,248,854	871,961
60	60	2,017,280	1,487,801	827,745	516,520
Over 60	66	----------	----------	276,550	171,162
60 to 72	66	344,011	247,798	----------	----------
72	72	116,083	104,294	----------	----------
Over 72	74	114,118	55,881	----------	----------

week. This average was calculated for the various industrial and regional classifications for each census year from 1909 to 1921, inclusive. Prior to 1909 the Census Bureau did not publish frequency tables of the prevailing hours worked per week, and for the two census years prior to 1909 it was necessary, therefore, to fall back upon another method of working out the necessary averages, to be described presently.

CALCULATIONS OF AVERAGES OF PREVAILING HOURS OF WORK

The method of calculating the prevailing hours averages from the census tables follows the usual procedure for calculating weighted averages from frequency tables; that is to say, the number of employees listed in each hours bracket (between 48 and 54, 54 and 60, etc.) was multiplied by the number of hours taken as the midpoint of the hours group, it being assumed for the purpose of computing the average, that every employee in any hours group worked the number of hours represented by the assumed midpoint. The resulting products were then added and the sum of the products divided by the total number of employees shown in the frequency table, the result of this division being the required weighted average of prevailing hours worked per week.

The calculation of prevailing hours averages for the years 1899 and 1904 has been made with the aid of the data on full-time hours per week published by the United States Bureau of Labor Statistics for 15 industries. For the most part, the Bureau of Labor Statistics' relatives utilized here are not taken directly from the published statement of the Bureau of Labor Statistics, but from the more condensed arrangement of them published in Mr. I. M. Rubinow's article on "The recent trend of real wages." [3] The Bureau of Labor Statistics' relatives as reported by Mr. Rubinow are upon the original base used by the bureau (average, 1890–1899 = 100). For our present purposes, his series of relatives has been shifted to the base 1909 = 100. When this shift has been made, we have for all industries combined and for the separate industries a series of index numbers of full-time hours per week for each census year from 1899 to 1914, inclusive. We have also the above-mentioned series of weighted averages of prevailing hours worked per week for each of the census years from and including 1909. It will be evident, as is indicated by the figures in Table 166, that this gives us an overlap for the two census years 1909 and 1914. The United States Bureau of Labor Statistics' index number for 1914 on the 1909 base is 96; the index of the weighted census average for 1914 on the same base is 97. This close correspondence seems to indicate that the United States Bureau of Labor Statistics' index

[3] 4 American Economic Review 810 (December, 1914).

numbers for the earlier period may safely be relied upon as the basis for projecting backward to 1899 the series of weighted averages derived from the census reports. This, accordingly, has been done. The year 1909 being taken as 100, it follows that the probable weighted average for 1904 will be the number of hours which bears the same relation to the known census average as the Bureau of Labor Statistics' relative, 102, bears to its base. In Table J, on page 405, the detailed results are shown for the different selected industries. In this table the names of the selected industries covered in this monograph and the most nearly cognate of the United States Bureau of Labor Statistics' relatives (which are used in splicing) are listed in parallel columns.

TABLE 163.—CALCULATION OF COMPLETE SERIES OF AVERAGES OF PREVAILING HOURS WORKED PER WEEK, ALL INDUSTRIES COMBINED: 1899–1921

YEAR	INDUSTRY CLASSIFICATION		U. S. BUREAU OF LABOR STATISTICS' RELATIVES OF FULL-TIME HOURS PER WEEK		Spliced series of prevailing hour averages [2]
	Selected industries used in this book	U. S. Bureau of Labor Statistics series used	(Average, 1890–1899=100) [1]	(1909=100)	
1899	All industries	15 industries combined	99.2	105	59.63
1904			96.0	102	57.93
1909			94.4	100	56.80
1914			[3] 90.1	96	55.10
1919					50.80
1921					50.30

[1] U. S. Bureau of Labor Statistics' indices, as reported by I. M. Rubinow.
[2] Figures for 1909–1921, inclusive, are weighted averages computed from census data; figures for 1899–1914 are calculated on the basis of the series of indices on the 1909 base.
[3] Relatives for 1914 are taken from a more recent article, which has brought more nearly down to date the analysis of the U. S. Bureau of Labor Statistics' data originally made by Mr. Rubinow ("The Movement of Real Wages, 1890–1918" (Paul H. Douglas and Francis Lamberson, 11 American Economic Review 413, September, 1921)).

It is all too evident that the industry classifications do not match as well as might be desired. For a number of our selected industries, indeed, there is no cognate series of the United States Bureau of Labor Statistics' indexes and for such industries we have had to fall back upon the United States Bureau of Labor Statistics' relatives for all of the 15 industries combined, as reported by Mr. Rubinow. For some of the selected industries exactly the same United States Bureau of Labor Statistics' series could be used. In one case, namely, that of bread and other bakery products, the United States Bureau of Labor Statistics' relatives for bakers has been used. This, however, is apparently the only instance where an occupational series has been used in connection with an industrial series. In the all too numerous instances where the United States Bureau of Labor Statistics' series for all industries has had to be used, it is probably true that in the final series of prevailing hour averages, the items for 1899 and 1904 are really not industrial series at all but more in the nature

of general series representing all industries. This would be the situation in all of the instances where the United States Bureau of Labor Statistics' relatives for all industries are used, were it not that at the point where the splicing is done, in 1909, it has been possible to introduce separate weighted census averages for each of the selected industries. The relative changes back from those averages to 1904 and on back to 1899 are exactly the same except where the special United States Bureau of Labor Statistics' indexes are used for the industries involved. The result, however, is a slightly different series for practically all of the selected industries, and this result, of course, is a compromise between the use of the single "all industries" series for separate industry groups and the other alternative, which is the ideal but here quite impossible one, of having a separate series of relatives definitely representing each one of the selected industries.

Prevailing hour averages for geographic divisions for the census years 1909 to 1919, inclusive, were computed from the census frequency tables in the same fashion as already described for industry groups. No frequency data are available for the 1921 census for geographic divisions. Consequently, in each geographic division, the prevailing hour average has been assumed to have diminished from the year 1919 in the same proportion as it definitely has been shown to have diminished in the United States as a whole. The averages, for 1899 and 1904, for the separate geographic divisions, were estimated by making, with the aid of the United States Bureau of Labor Statistics' indexes, a backward projection similar to that already described for the selected industries. In Table 167 (p. 360) the resulting complete series of prevailing hour averages for the nine geographic divisions are shown.

TABLE 164.—PREVAILING HOUR AVERAGES (WEIGHTED), BY GEOGRAPHIC DIVISIONS, ALL INDUSTRIES COMBINED

DIVISION	1899 [1]	1904 [1]	1909	1914	1919	1921 [2]
United States	59.6	57.9	56.8	55.1	50.8	50.3
New England	58.5	56.8	55.7	54.1	49.6	49.1
Middle Atlantic	59.0	57.3	56.2	54.3	49.6	49.1
East North Central	59.5	57.8	56.8	54.8	51.3	50.8
West North Central	59.3	57.6	56.5	55.2	51.5	51.0
South Atlantic	61.8	60.1	58.9	57.7	53.5	53.0
East South Atlantic	62.4	60.6	59.4	57.9	55.3	54.7
West South Central	62.8	61.0	59.8	58.5	54.9	54.4
Mountain	60.1	58.3	57.2	55.5	52.0	51.5
Pacific	59.2	57.5	56.4	54.9	47.5	47.0

[1] The 1899 and 1904 figures for the separate geographic divisions are estimated by making a projection back through those years on the basis of U. S. Bureau of Labor Statistics' index numbers for all industries combined.

[2] No census data available for geographic divisions. In each geographic division the prevailing hour average has been assumed to have diminished in the same proportion that it decreased in the United States as a whole.

The way in which the average full-time hours per week, which we have now obtained, are applied in conjunction with full-time weekly earnings to arrive at estimated earnings per hour, is shown in Table 168, in which are used, for illustration, the figures for all industries combined.

TABLE 165.—DERIVATION OF ESTIMATED AMOUNTS OF HOURLY EARNINGS, PER CAPITA, ALL INDUSTRIES COMBINED

CENSUS YEAR	Average full-time hours per week	Estimated full-time weekly earnings per capita	Estimated amount of hourly earnings per capita
1899	59.63	$10.29	$0.1726
1904	57.93	11.56	.1996
1909	56.79	12.60	.2219
1914	55.07	14.10	.2560
1919	50.80	28.09	.5530
1921	50.30	28.67	.5700

Chapter XIX

THE INTERPOLATION OF INTERCENSAL YEARS

The average annual earnings and changes therein which have been estimated and reported in preceding pages are for the most part for those years in which the United States census of manufactures was taken. They are, within the period of this study, 1899, 1904, 1909, 1914, 1919, 1921, 1923, and 1925. It will be noticed, however, that some results are given for each year of the 27-year period—they include, that is to say, intercensal as well as census years. The inclusion of these series in complete annual form has been made possible by resort to the supplementary use of the figures on average per capita earnings reported by the United States Bureau of Labor Statistics and by the States of New York, Massachusetts, and Wisconsin.

There is, undoubtedly, some inconsistency involved in resorting to index numbers of (*actual*) per capita earnings to fill in the intercensal interstices of a series of average wages, which, as we have emphasized in an earlier chapter, show changes in *full-time* and not in actual earnings. And, no doubt, the interstitial index numbers, resulting from this illogical procedure are less accurate than would be results derived from appropriate (but nonexistant) relatives of full-time earnings. Data for actual weekly earnings have been relied upon because, so far as we know, there are no other data available. The United States Bureau of Labor Statistics published, in its bulletins on wages and hours, some fragmentary figures on full-time earnings, but they are not annual and they do not represent manufacturing industry as a whole.

It would, of course, be foolish to claim a high degree of accuracy for the estimates of amounts of per capita earnings, or even of changes in earnings, finally arrived at through interpolation, but comparisons (such as are made in Part I) with results reached by such agencies as the National Bureau of Economic Research tend to confirm the belief that the present results, in respect, at least, to *changes* in earnings, are not seriously in error.[1]

The results that we have been able to report in annual form as a result of interpolation are for the United States as a whole, all industries combined, and for each of the 12 of our 41 selected industries which also happen to be reported for per capita earnings for the period 1915 to 1925 by the United States Bureau of Labor Statistics. It

[1] See Table 17, p. 48.

has not been possible to report earnings in annual form for any of the other selected industries or industry groups, nor has it been possible to report them separately in this form for any geographic subdivision of the United States. The annual figures for all industries combined and for each of the 12 selected industries cover the whole of our period of 1899 to 1925.

The procedure followed in arriving at the annual series of amounts of, and changes in, earnings is indicated in Table 166 and Table 167.

SOURCE MATERIALS FOR INTERCENSAL INTERPOLATIONS

The necessary starting point is the estimation of the intercensal counterparts of the index numbers of census average earnings, or what may be called "intercensal mean-wage payments." It is not necessary, of course, actually to get a dollar sum representing for the intercensal years the same metaphysical something that is represented for the census years, by the census average wage.[2] It is necessary only to get a series of relatives for the years intervening between census years, which shall indicate the size of the average wages in those years relative to the amount of the census average wage for census year. The development of these relatives, in the case of all industries combined, rests upon the utilizaton of a spliced series containing for the period 1899 to 1913, inclusive, the Massachusetts figures for average yearly earnings, and for the remainder of the period per capita earnings figures obtained by striking a simple average of the relatives (1) the per capita weekly earnings reported for the United States by the United States Bureau of Labor Statistics and for two of the States by the New York State Department of Labor and the Wisconsin Industrial Commission and (2) the average yearly earnings reported by the Massachusetts Department of Labor and Industries. The Massachusetts figures, which constitute the sole ingredient for the first part of our period, are shown in the first column of Table 166. The figures are those published in the annual reports on the Statistics of Manufactures by the Massachusetts Department of Labor and Industries. The figures are described in the report as "average yearly earnings"; they are computed in the same way that the Census Bureau calculates its "average wages." The data for the latter part of the period, including the single Federal series and the three State series, are based in the case of Massachusetts directly upon index numbers. Consequently, the splicing of the two periods is not done until the Massachusetts absolute amounts have been converted into index numbers. The computation of the averages for the last part of the period is outlined in Table 167. The index numbers shown in that table for the United States are

[2] See initial paragraph, Ch. XIII, p 269.

TABLE 166.—BASIS FOR COMPUTING INTERCENSAL RELATIVES OF AVERAGE WAGES FOR THE PURPOSE OF CONSTRUCTING A YEARLY INDEX OF ANNUAL EARNINGS PER CAPITA

YEAR	Massachusetts average yearly earnings[1]	Relatives (preceding census year, 100)	Spliced series (preceding census year, 100)[2]	YEAR	Massachusetts average yearly earnings[1]	Relatives (preceding census year, 100)	Relatives of per capita earnings, United States Bureau of Labor Statistics, as computed by Federal Reserve Bank of New York.[3]		Spliced series (preceding census year, 100)[2]
							December, 1914, base	Yearly, 1914, base[4]	
	A	B	E		A	B	C	D	E
1899	$427.60	1.000	1.000	1914	$562.57	1.000	[5] 1.000	1.000	[6] 1.000
1900	441.61	1.032	1.032	1915	580.61	1.031	1.020	[7] .960	[6] 1.021
1901	449.69	1.050	1.050	1916	656.23	1.167	1.210	1.140	[6] 1.179
1902	459.98	1.074	1.074	1917	758.23	1.349	1.430	1.350	[6] 1.367
1903	471.52	1.102	1.102	1918	944.65	1.680	1.851	1.747	[6] 1.791
				1919	1,073.95	1.000	2.171	2.048	[6] 1.000
1904	467.44	1.000	1.000						
1905	477.07	1.020	1.020	1920	1,280.74	1,192	2.601	2.458	[6] 1.203
1906	494.96	1.060	1.060	1921			2.240	2.120	[6] 1.000
1907	515.18	1.102	1.102	1922			2.127	2.030	[6] .976
1908	510.71	1.091	1.091	1923			2.356	2.220	[6] 1.000
				1924			2.330	2.200	[6] .990
1909	515.21	1.000	1.000	1925				2.280	[6] 1.040
1910	526.92	1.021	1.021						
1911	532.76	1.034	1.034						
1912	551.36	1.070	1.070						
1913	569.43	1.112	1.112						

[1] Annual Statistics of Manufactures, Massachusetts.

[2] 1899–1913 based on Massachusetts relatives; 1915–1923 based on average of relatives (of per capita earnings) from U. S. Bureau of Labor Statistics (13 industries, United States) New York, Massachusetts, and Wisconsin.

[3] Chain relatives computed by Federal Reserve Bank of New York, from U. S. Bureau of Labor Statistics month-to-month link relatives. Average weekly earnings of factory workers in New York State and in the United States, Statistics Department, Federal Reserve Bank of New York, Nov. 4, 1921, and correspondence from Carl Snyder. The bank gives monthly chain relatives. These have been averaged for the above annual figures.

[4] Base shifted to year 1914 by dividing relatives of preceding column by 1.06 ratio obtained by dividing average number of wage earners (census 1914) employed in 1914 by number employed in December, 1914. This assumes that for this short period rates were not appreciably changed and that money earnings varied as employment.

[5] For December, 1914.

[6] Figures for these years not from col. D but from last column of Table 167.

[7] Index number for New York State as reported by Federal Reserve Bank of New York; no data from U. S. Bureau of Labor Statistics.

not taken directly from the official report of the United States Bureau of Labor Statistics, since the bureau does not publish chain relatives of per capita earnings.[3] The Federal Reserve Bank of New York City has chained the Bureau's published link relatives for each of the 13 industries which the Bureau of Labor Statistics has reported since 1915, and for all of them combined. We are not, just now, concerned with the Federal reserve bank's chain relatives for the separate industries. The relatives are reported by the bank on the base—December, 1914 = 100. The bank presents the figures, moreover, by months. These monthly figures have been averaged to obtain annual relatives and the base shifted from December, 1914, to the year 1914.

[3] They are reported in the *Labor Review* in the form of "month to month percentages of change in per capita earnings."

This shift has been made by dividing the annual relatives, derived from the bank's monthly relatives, by 1.06. The latter figure is the ratio obtained by dividing the average number of wage earners shown by the census of 1914 to have been employed in that year by the number employed in December, 1914. The use of this division in shifting the base naturally rests upon the assumption that for this short period money earnings vary as employment.[4]

The data of Table 167, for New York, Massachusetts, and Wisconsin, are taken, for the most part, from the *Survey of Current*

TABLE 167.—CONSTRUCTION OF CONSOLIATED SERIES OF RELATIVES OF PER CAPITA EARNINGS: 1914–1925

YEAR	AVERAGE PER CAPITA EARNINGS RELATIVES ON 1914 BASE [1]				UNWEIGHTED AVERAGE	
	United States [2]	New York [3]	Massachusetts [3]	Wisconsin [3]	1914=1.000	Preceding census year =1.000
1914	1.000	1.00	1.000	[4] 1.00	1.000	1.000
1915	[5] .960	1.03	1.032	1.06	1.021	1.021
1916	1.140	1.16	1.166	1.25	1.179	1.179
1917	1.350	1.31	1.347	1.46	1.367	1.367
1918	1.747	1.88	1.678	1.86	1.791	1.791
1919	2.048	1.88	1.908	2.09	1.982	1.000
1920	2.458	2.26	2.276	2.54	2.384	1.203
1921	2.120	2.06	1.968	2.02	2.042	1.000
1922	2.030	2.01	1.966	1.96	1.992	.976
1923	2.220	2.18	2.238	2.18	2.205	1.000
1924	2.200	2.22	2.107	2.23	2.190	.990
1925	2.280	2.27	----------	[6] 2.33	2.293	1.040

[1] Massachusetts figures through 1922, based on average yearly earnings. (For construction of 1922 and 1923 indices, see Survey of Current Business, May, 1924, p. 169, note 3.)
[2] As reported by Federal Reserve Bank of New York, United States indices for 1924 and 1925 computed by dividing U. S. Bureau of Labor Statistics annual index of pay-roll totals by its index of employment. Monthly Labor Review, January, 1926, p. 157.
[3] Survey of Current Business, May, 1924, p. 169, and February, 1925, p. 117.
[4] First quarter of 1915=100 and 1914 assumed as 100.
[5] Federal reserve bank uses New York data for this year.
[6] Based on first 11 months of the year.

Business for May, 1924 (p. 169). The figures in the Massachusetts series through 1922 are based upon identical plants as reported through a yearly census. The figures for 1923 and 1924, according to the explanation in the *Survey of Current Business*, are connected to the series by the chain-relative method, representing at least 40 per cent of the firms included in the yearly figures. The United States figures, although described by the Federal Reserve Bank of New York as "average weekly earnings," are not, of course, precisely

[4] The Federal reserve bank's relatives were taken from the mimeographed report issued on Nov. 4, 1921, by the bank's statistics department under the title "Average Weekly Earnings of Factory Workers in New York State and the United States." This mimeographed report carries the figures only to the end of the year 1921. Figures for the years 1922, 1923, and 1924 were kindly furnished to the writer by Mr. Carl Snyder, of the Federal reserve bank. For 1925 the relatives were derived from the reports of the United States Bureau of Labor Statistics. They are the quotients of the bureau's indexes of pay roll divided by its indexes of employment. The December, 1925, figure was assumed to be the same as November. (*Labor Review*, January, 1926.)

what that phrase might imply. The Bureau of Labor Statistics computes its month to month percentages of change in per capita earnings by dividing the amount paid in wages during some pay-roll period of each month by the number of wage earners on the pay-roll for that same day period. The result, expressed only on a relative basis, is taken by the bureau to indicate, when compared with some preceding or following month, month to month changes in per capita earnings for the period covered. This period, it is to be noted, in some cases is one week and in some cases two weeks, so that the designation used by the United States Bureau of Labor Statistics—"per capita changes in earnings"—is more accurate. The figures for New York and Wisconsin are average weekly earnings computed by dividing the total weekly pay roll by the number of employees on the pay roll. It would be, of course, logically impossible to combine average yearly earnings in Massachusetts with average weekly earnings in other States, if those earnings were expressed in dollar sums. The figures in Table 167, however, are all on a relative basis and there seems to be no reason why the relatives derived from per capita yearly earnings and per capita weekly earnings should not be averaged as they have been in this instance.

The next step is to calculate the intercensal relatives from the money sums reported in the first part of the period and from the single-base relatives reported in latter part of the period. This is done in each case by taking the item for the census year as 1.00 and dividing the absolute sum or index number for each of the years within each intercensal period by the money sum or relative for the preceding census year. The results of these calculations are shown in columns B and E of Table 166 and the last column of Table 167. The last column of Table 166 shows the complete spliced series ready for application to the known amounts of census average wages[1] directly calculated from census data for census years.

ESTIMATION OF AMOUNTS OF INTERCENSAL AVERAGE EARNINGS

The estimation of intercensal mean wage payment amounts is now a simple matter. The census average wage for 1899, for example, for the United States, all industries combined, is $426; this sum, multiplied by the ratios which have been derived as explained in preceding paragraphs and which are shown in the last column of Table 166, produces corresponding money sums for intercensal years which may be taken as representing the most probable intercensal values corresponding to the amount of the census average wage[1] for census years. From this point on the procedure is in no way different from that which has been explained in preceding chapters. The first

[1] See initial paragraph of Chap. XIII, p. 269.

step being as before the calculation, now for *each year*, of intercensal index numbers upon the 1904 base. The procedure followed is illustrated in Appendix II.

It should be noted that the average wage figure in Appendix II for 1927, although it is for a census year, is not derived from census data as are corresponding earlier figures for census years. The reason is that, at the time of writing, census data are not yet available for the year 1927. The mean-wage-payment estimate for 1927 has been reached, therefore, by applying to the corresponding known sum for 1925 ($1,280) the ratio of increase shown (by the series of indexes of average wages in the first column) between average per capita earnings for 1925 and 1927. The same procedure, naturally, was followed in estimating corresponding 1927 items for each of the 12 selected industries for which annual series are reported.

INTERCENSAL INTERPOLATIONS FOR 12 SELECTED INDUSTRIES

In the case of the annual series shown for each of the 12 selected industries, the process of interpolating the intercensal values has followed the same general lines as those marked out in the preceding paragraph. Because of the lack of correspondence in the industrial classifications used by the United States Bureau of Labor Statistics and the States of New York, Massachusetts, and Wisconsin, it was decided to let the interpolation of intercensal years, for these industries, for the period 1914–1927 rest entirely upon per capita changes in earnings reported for the 12 industries by the United States Bureau of Labor Statistics. Instead, however, of taking the month to month percentages of change in per capita earnings, reported in the *Monthly Labor Review*, again in this case use has been made of the corresponding chain relatives which the Federal Reserve Bank of New York has calculated from the bureau's link relatives. The Federal reserve bank's chain relatives are shown, by months, on the December, 1914, base. These figures were averaged for annual relatives and the base shifted to the year 1914 in the same manner as described above for all industries combined. The resulting figures are taken as relatives of per capita earnings in the United States for the industries involved. They are then shifted from the single base 1914 and put in the form of intercensal relatives having as base, in the case each year of any given intercensal group, the preceding census year as 1.000. These intercensal indexes are then multiplied by the known "census average wages," already calculated from census data, to form corresponding interpolated "average wages." Relatives are then calculated as before upon the 1914 base and the same procedure followed as in the case of the census year items. The procedure is illustrated by figures of Table 168 which shows for woolen goods the manner of applying the

Federal reserve bank's chain relatives for the interpolation of intercensal "mean-wage payment" sums.

TABLE 168.—ILLUSTRATION OF METHOD OF INTERPOLATION OF INTERCENSAL YEARS, FOR SEPARATE INDUSTRIES

(Woolen and worsted goods)

YEAR	U. S. Bureau of Labor Statistics relatives of per capita earnings, as compiled by Federal Reserve Bank of New York	Intercensal relatives	Census average wage (intercensal years interpolated)	Relatives of per capita full-time earnings (1904=100)	Estimated full-time weekly earnings
1904			$388	1.00	$10.03
1914	1.00	1.00	479	1.23	12.33
1915	.96	.96	460	1.19	11.94
1916	1.20	1.20	575	1.48	14.84
1917	1.49	1.49	714	1.84	18.46
1918	1.85	1.85	886	2.28	22.87
1919	2.06	1.00	1,008	3.00	26.06
1920	2.64	1.27	1,280	3.30	33.10
1921	2.43	1.00	1,077	2.78	27.88
1922	2.35	.97	1,045	2.69	26.98
1923	2.64	1.00	1,170	3.02	30.29

The interpolation of intercensal data for the 12 industries for the period 1899–1914 rests entirely upon State data on average yearly earnings. The States whose statistics were drawn upon for this purpose were Massachusetts, Pennsylvania, Connecticut, New Jersey, and Iowa. Not all of these States contributed to each of the 12 industries, and not all of the States are represented by data for the whole 15-year period. It is evident that this part of the intercensal interpolation rests upon a very fragmentary statistical foundation. However, it has seemed adequate for the indication of the most probable intercensal values. The detailed procedure need not be recited, since it is essentially the same as that already described for all industries combined.

Chapter XX

THE ESTABLISHMENT AVERAGE WAGE AND THE ESTIMATION OF VARIABILITY

The great bulk of the statistical material presented in the preceding chapters is based in the last analysis upon a single statistical item, which has been called the "census average wage."[1] This average has been discussed elsewhere and the reminder need only be made at this point that it is struck by dividing aggregate wage pay-roll amounts by corresponding aggregates of the average number of wage earners. These aggregates, of course, represent varying numbers of establishments in different industry groups, as well as in different cities, States, and other regional jurisdictions. The fact is to be emphasized that the census average wage[1] is calculated by the process of division above described separately applied to each classification for which it is desired. Take, for example, two establishments in the iron and steel industry in a given city: Each one reports the total amount paid during the year to its wage earners. It also reports the average number of wage earners, an average which is obtained, as heretofore explained, by dividing the number of wage earners on the pay rolls, on or near the 15th of each month, by 12, regardless of the time the plant was in operation. The sum paid to wage earners in establishment A is added to the sum paid to wage earners in establishment B; also the average number of wage earners in establishment A is added to the average number of wage earners in establishment B. If these two were the only concerns in the iron and steel industry in the given city, the census average wage[1] for that industry in that city would be represented by the quotient obtained by dividing the first of the two aggregates, just mentioned, by the second. Evidently, then, it ought to be possible by consulting the original establishment schedules in the archives of the Census Bureau to compute for each one of any group of establishments in any census year the corresponding census average, which may be called an establishment mean-wage payment or an establishment average wage. This item would have for single establishments a significance very similar to that of the corresponding census average wage[1] computed by division of the aggregates shown in the published reports of the Census Bureau.

[1] See initial paragraph of Ch. XIII, p. 269.

THE ESTABLISHMENT AVERAGE WAGE

It is this establishment average wage item upon which we fall back in order to get some idea of certain facts about earnings which are not revealed by the estimated amounts and relatives which constitute the main result of this analysis of the census wage data. These estimated amounts and the corresponding index numbers of changes in those amounts are all derived, as just pointed out, from a single average wage.

The census average wage,[1] in addition to the defects due to the method by which it is calculated, has the shortcomings of any average. Obviously, an average wage or an average amount of earnings is an amount which may not be received by any single person in the group whose wages are averaged. For example, take a concern so small as to be unrepresentative, but which has at least the merit of making the illustration simple: It employs five wage earners whose annual earnings are $1,000, $1,400, $800, $700, and $1,040, respectively. The average wage of these five wage earners is $988. No single one of the five wage earners received $988, yet the sum $988 probably gives as faithful an idea as any other single amount would give of the per capita earnings prevailing in this group. Ideally, we would be able to get the most realistic picture of what wage earners actually get by making a complete census in which each wage earner would report the amount he received in earnings during the year, or in which there were taken off from the books of the employer the sums paid to each individual wage earner. Such a task on a census basis would, of course, be impossible. It would require more time and money than the Census Bureau could possibly command. But if such a complete census of individual earnings could be made, it would be possible to construct frequency tables showing the number of wage earners in different groups who received earnings within specified limits. We must content ourselves, however, with the data which are available on the census schedules.

The special inquiry into variability was made in the belief that the establishment average wage derived from the returns on the original establishment schedule might be made the basis for an estimate of the distribution of earnings above and below the average. Obviously, it is very important to know not only what the average wage is, but also, if possible, to get some notion as to what proportion of the wage earners received earnings closely approximating that average and how many wage earners, on the other hand, received earnings vastly higher or lower than that average. In the case cited above, it is evident that the average, $988, conceals individual earnings ranging from $700, received by the man who earned the least, up to $1,400, received by the man who earned the most.

Obviously, the same average might cover a much more complex situation.

Unfortunately, in attempting to make use of original establishment data, in order to get some notion of the range of earnings above and below the average, we still find ourselves obliged to depend upon an average, the same census average wage[1] already referred to so often. At first blush, it would seem that this fact would completely nullify any attempts to get behind the average.

The results attained must certainly be taken with much more caution than if those results had been arrived at by an examination of the sums received by individual wage earners in the different establishments. Despite misgivings, however, the experiment has been made, and it is believed that the results are not without significance. It is further felt that the results probably reflect, with some considerable degree of faithfulness, the degree of concentration of earnings in different industries in the year 1919 and make possible some significant comparisons with earlier estimates of variability.

PROCEDURE IN ANALYSIS OF VARIABILITY

The results are set forth in Chapters X and XI. Their meaning and validity will be more evident, pernaps, after some explanation of the procedure. In the variability inquiry, made primarily for the census year 1919, only the resulting earnings shown for that year are adjusted also to the purchasing power basis appropriate for comparison, respectively, with variability data for 1899 and 1904. The first step in the work was to decide upon geographic and industrial limits for the analysis. The very large number of establishments in the United States seemed to make it inadvisable to try to include all industries or all regions of the country. There were selected, therefore, 20 of the more important of the 41 industries selected for treatment in other parts of this monograph and 8 of the larger cities of the United States; that is to say, only the schedules from establishments in these 20 industries were used, and within these 20 industries, only such establishment schedules were used as came from one or another of the 8 cities. The cities covered in the inquiry are Pittsburgh, Detroit, Cleveland, Chicago,[2] San Francisco, New York, Boston, and St. Louis; and the selected industries are as follows:

Slaughtering, wholesale, excluding meat packing.
Iron and steel, steel works and rolling mills.
Automobiles.
Cars and general shop construction and repairs for steam railroads.
Printing and publishing.
Foundry and machine-shop products.
Brass, bronze, and copper products.
Furniture.
Mineral and soda waters.
Clothing, women's.
Boots and shoes.

[1] See initial paragraph, Ch. XIII, p. 269.

[2] The 20 industries were not analyzed separately for Chicago.

Tobacco, cigars and cigarettes.
Glass.
Petroleum refining.
Agricultural implements.
Paper and wood pulp.
Lumber and timber.
Flour-mill and gristmill products.
Rubber tires and inner tubes.
Cotton goods.

There are in these 20 industries in these 8 cities slightly more than 15,000 establishments and over 523,000 wage earners. We have, therefore, in this sample, about 10 per cent of the establishments and 11 per cent of the employees in the 20 industries in the whole United States and 20 per cent of the establishments and 30 per cent of the employees in all industries in these cities; and about 4 per cent of the establishments and nearly 6 per cent of the employees in all industries in the whole of the United States.

TREATMENT OF THE ESTABLISHMENT SCHEDULE

In the case of each establishment schedule, the following items were drawn off on establishment cards: (1) Days in operation, (2) amount paid to wage earners, and (3) average number of wage earners. A copy of the form of card used for transcribing this information is reproduced below.

City NEW YORK Industry No. 255c

(*a*) Days in operation (Inquiry 7)*
(*b*) Per cent (*a*) is of 307
(*c*) Amount paid wage earners (Inquiry 6)*
(*d*) Average number of wage earners (Inquiry 5)*
(*e*) Average full-time earnings (*c*) ÷ (*d*)
(*f*) Average actual earnings (*b*) × (*e*)

*Numbers of the inquiries in the General Schedules, Census of Manufactures, 1919.

No schedule was used where any of these three items was missing. Because of omissions, not quite all of the establishments in the selected cities and industries, which reported to this census, were included in this analysis. Items *a*, *c*, and *d* are copied from the schedule. The items which constitute the unit in the classified tables and percentile arrays in Part V, and from which the ratios of variation are calculated, are those on lines *e* and *f* of the card. These items represent, respectively, the mean full-time per capita money earnings and the mean actual per capita money earnings for the establishment represented by the card. Item *e*, representing per capita full-time earnings, is obtained by dividing the average number of wage earners (*d*) into the total amount which their employer paid out to them in wages during the year (item *e*). These full-time earnings are deflated in the case of those establishments which worked less than 307 days during the year by multiplying full-time earnings, shown on line *e*,

by the percentage reported on line *b*, it being assumed that 307 days of operation represents full-time employment and that the ratio of actual to full employment is roughly represented by the ratio of the number of days in actual operation to 307.[3]

After cards were filled in for the 15,000 establishments, which are included in the analysis, the cards for each industry and the city cards for all industries combined were arrayed in the order of increasing amounts of actual earnings. In other words, all of the cards for the women's clothing industry, for example, were sorted with the card showing the least amount of earnings at the top of the pile and with the card representing the establishment, the average wage of which was next larger, next in the pile and so on to the last card in the pack, which represented the establishment in which the amount of average actual earnings per capita was the highest of all establishments in that industry. With the cards thus sorted the item for which they were arrayed, that is to say, the average actual earnings (item *f*) on the card, was transferred to tally sheets and along with this item, and opposite to it, was listed in another column the average number of wage earners in the establishment for which average actual earnings were shown. The same procedure followed for full-time earnings. A sample of the tally sheet used in this analysis is shown in Table 169. The particular tally sheet shown is taken from an array of all of the cards from the automobile industry in the seven cities [4] in the order of increasing full-time (and, also, actual) earnings. The tally sheet, as indicated in the illustration, contains two sets of arrays, one of which is for average full-time and the other for average actual earnings, the former being obtained in the same way as actual earnings, by arranging the cards according to increasing or decreasing items of average full-time earnings (item *e* on the card), and placing opposite the average full-time earnings item, for each establishment, the average number of wage earners in that establishment. For each of the two sorts of arrays, the one on the left and the one on the right hand side of the talley sheet, two additional columns are provided—one for the number of establishments and one for cumulative percentages of employees. The column headed "Number of establishments" has not been utilized on the tally sheets, each line represents one establishment and there are, therefore, as many establishments as there are lines on the tally sheet or used portion thereof. The cumulative percentages are calculated in the usual fashion, in this case beginning at the bottom of the tally sheet with the highest

[3] Both of these assumptions are subject to appreciable margins of error. It is realized also that they are somewhat inconsistent with the theory on which rests the bulk of the analysis in this book. The malpractice, if there is any, is chiefly in connection with this present analysis of variability. Such possible malpractice, however, affects mainly, it is believed, the decil and percentil amounts of earnings reported. There seems no ground for believing that it seriously affects the percentage distribution tables showing concentration or the derived ratios of variation.

[4] Chicago having been omitted.

TABLE 169.—SAMPLE TALLY SHEET (AUTOMOBILE INDUSTRY)

Establishment No.	Decil points in number of wage earners	Average number of wage earners	Cumulative percentage	Average full-time earnings	Establishment No.	Decil points in number of wage earners	Average number of wage earners	Cumulative percentage	Average full-time earnings
1		16.0	100.0	$635	33	10	149.3	100.0	$628
2		4.8	100.0	729	1		16.0	99.7	635
3	10	635.0	100.0	818	8		51.6	99.7	676
4		150.0	98.6	833	2		4.8	99.6	729
5		27.1	98.3	856	3		635.0	99.6	818
6		15.5	98.2	955	4		150.0	98.2	833
7		12.0	98.2	1,003	5		27.1	97.9	836
8		51.6	98.2	1,032	6		15.5	97.8	955
9		3.0	98.1	1,032	7		12.0	97.8	996
10		210.0	98.0	1,046	9		3.0	97.8	1,022
11		281.6	97.6	1,059	10		210.0	97.7	1,046
12		154.2	97.0	1,110	28		128.9	97.3	1,047
13									
14		281.8	96.5	1,179	11		281.6	97.0	1,059
15		29.5	95.9	1,189	51		22.5	96.4	1,075
16		49.4	95.8	1,216	12		154.2	96.4	1,110
17		37.4	95.7	1,226	13		78.8	96.0	1,136
18		29.6	95.6	1,248	14		281.8	95.9	1,179
19		58.7	95.6	1,216	16		49.4	95.3	1,188
20	9	3,456.2	95.5	1,337	15		29.5	95.2	1,189
21		659.1	88.1	1,342	17		37.4	95.1	1,226
22		79.8	86.7	1,345	21		659.1	95.0	1,228
23		123.4	86.5	1,354	18		29.6	93.6	1,240
24		1,225.8	86.2	1,357	41		369.8	93.5	1,248
25		218.8	83.6	1,378	31		691.7	92.8	1,304
26		124.8	83.2	1,380	19		58.7	91.3	1,307
27		476.6	82.9	1,383	22		79.8	91.2	1,314
28		128.9	81.9	1,391	43	9	1,806.8	91.0	1,326
29		326.3	81.6	1,400	20	8	3,456.2	87.1	1,333
30		263.2	80.9	1,417	23		123.4	79.7	1,336
31	8	691.7	80.3	1,425	24		1,225.8	79.5	1,353
32		14.0	78.9	1,425	27		476.6	76.9	1,360
33		149.3	78.8	1,438	25		218.8	75.8	1,378
34					26		124.8	75.4	1,380
35	7	7,633.7	78.4	1,457	30		263.2	75.1	1,385
36		75.8	62.1	1,468	29		326.3	74.5	1,395
37		174.2	61.9	1,493	32		14.0	73.8	1,420
38		30.5	61.5	1,496	35	6–7	7,633.7	73.8	1,424
39	(m) 5–6	6,111.8	61.5	1,499	57		256.2	57.5	1,434
40		938.6	48.4	1,523	36		75.8	57.0	1,449
41		369.8	46.4	1,526	52		315.1	56.8	1,453
42		43.8	45.6	1,532	34		60.8	56.1	1,454
43		1,806.8	45.5	1,566	47	(m) 5	5,304.3	56.0	1,456
44	3–4	5,633.2	41.7	1,566	45		7.0	44.7	1,484
45		7.0	29.6	1,571	37		174.2	44.7	1,493
46		1,008.1	29.6	1,573	38		30.5	44.3	1,496
47	2	5,304.3	27.5	1,597	42		43.8	44.2	1,497
48		356.3	16.2	1,606	39	4	6,111.8	44.1	1,499
49		1,115.7	15.4	1,622	40	3	938.6	31.1	1,523
50	1	4,735.8	13.0	1,633	44	2	5,633.2	29.1	1,525
51		22.5	2.9	1,650	46		1,008.1	17.0	1,547
52		315.1	2.8	1,690	48		356.3	14.9	1,554
53		34.5	2.2	1,739	56		5.1	14.1	1,578
54		256.5	1.6	1,754	50	1	4,735.8	14.1	1,590
55		147.0	1.2	1,779	49		1,115.7	4.0	1,601
56		5.	1.2	1,794	53		34.5	1.6	1,699
57		256.2	1.2	1,827	54		256.5	1.5	1,714
58		198.2	.7	1,947	55		147.0	1.0	1,779
59		98.5	.3	2,030	58		198.2	.7	1,947
60		22.1	(1)	2,262	59		98.5	.3	2,023
					60		22.1	(1)	2,240
Total number of wage earners.		46,825.8					46,825.8		

[1] Less than one-tenth of 1 per cent.

average earnings item and proceeding up the sheet to the smallest earnings item in the group involved. Each cumulative percentage shows the proportion of the total number of persons in the industry or city involved who received earnings as great as or greater than the amount of earnings listed to the right of the cumulative percentage column. More precisely, the cumulative percentages show the proportions of the total number of employees in the industry group or groups or in the specified city or cities who were employed in establishments where the average full-time or average actual earnings were as great as or greater than the amount shown.

The next step is to compress the arrays which show each establishment separately into frequency distribution tables which show by earnings classes the number of establishments and the corresponding number of wage earners employed therein; that is to say, the number of wage earners employed in establishments where the average full-time, or average actual, earnings were between $1,000 and $1,099, and the number of establishments in which the average earnings amounts fell between these sums, and so on for other frequency classes shown in the tables in Chapters X and XI.[5]

The array of the 59 automobile establishments shown in Table 169 has been put in graphic form in Figure 2 (p. 37). The graph indicates that most of the very small establishments made average wages which were either extremely high or extremely low. The great bulk of the 47,000 employees of the 59 concerns evidently were employed in a handful of plants in which average wages paid were quite close to the average wage in the median plant.

DEFLATION FOR HISTORICAL COMPARISONS OF VARIABILITY

In reporting the 1919 situation it was not necessary, of course, to deflate earnings on account of changes in the cost of living. It was necessary, however, to do this in order to make any comparison with the results of other inquiries made in 1899 and 1904. This deflation was accomplished by dividing the full-time earnings items, this being the type of earnings used for the purposes of this comparison, by the cost of living coefficient on the 1899 and 1904 bases, respectively. Thus, for the 1899 comparison, the full-time earnings item for each establishment was divided by 2.63; the resulting deflated arrays of earnings amounts were then treated in the same way as the original items—the medians and decils of the new series being spotted and transferred to a comparative table of decils and medians. Also, the number of wage earners within designated limits in the new deflated array were ascertained and put into frequency tables constructed with class limits corresponding to the class limits used in the 1899 and 1904 investigations.[6]

[5] See also Table 118 and Tables H and I, on pp. 399 to 404.

[6] See Table 126, p. 249.

The procedure just outlined was actually used only in connection with one of the separate industry groups. For most of the work a short-cut method of accomplishing the same results was followed in the construction of frequency tables for comparison with 1899 and 1904 frequency tables. Each lower class limit (expressed in dollars) was multiplied by the deflation factor proper for the comparison to be made (namely, 2.63 for comparison with 1899 and 2.35 for comparison with 1904). The amount most nearly approximating the product obtained by multiplying the deflated coefficient by each lower class limit was then spotted on the tally sheet and the indicated cumulative percentage opposite that amount on the tally sheet taken off and entered opposite the lower class limit, originally expanded as just described, and so proceeding with each class at the lower limit—taking off the cumulative percentage appearing on the tally sheet opposite the products so obtained and forming in this fashion a series of cumulative percentages of wage earners receiving real wages in terms of the purchasing power of the earlier census years in each of the frequency classes. The class intervals used were obtained by an adjustment of published frequency tables of the census years 1899 and 1904 in such a way as exactly to match in class intervals the arrays used in this present 1919 analysis.

For the purpose of computing the coefficients of variation in the different industry groups, deflation does not need to be resorted to. The coefficient of variation is the percentage of variation, or the ratio of the standard derivation to the average, multiplied by 100. This coefficient was calculated from the frequency tables constructed from the undeflated full-time earnings data of the tally sheet.

CALCULATION OF COEFFICIENTS OF VARIATIONS

The method of calculating the standard deviation (σ) and coefficient of variation (V) is indicated for all of the 20 industries combined in Table 170. The data in the first two columns are taken from Table 118. The formula for the standard deviation (given on page 240 above) is—

$$\sigma = \sqrt{\frac{\Sigma f d^2}{n} - c^2}$$

The correction for error in assumed average is—

$$c = \frac{\Sigma f d}{n}$$

So that

$$\sigma = \sqrt{\frac{\Sigma f d^2}{n} - \left(\frac{\Sigma f d}{n}\right)^2}$$

Substituting from Table 170

$$\sigma=\sqrt{\frac{9{,}127{,}703}{426{,}989}-\left(\frac{-763{,}203}{426{,}989}\right)^2}$$

$$=\sqrt{21.3769-3.1949}$$

$$=4.264 \text{ (in class interval units).}$$

$$=\$426 \text{ in original units.}$$

Since the coefficient of variation (V) equals

$$\frac{\sigma}{\mathrm{M}}\times 100.$$

In this example

$$V=\frac{426}{1272}\times 100$$

$$=33.52 \text{ per cent.}$$

TABLE 170.—ILLUSTRATION OF METHOD OF COMPUTATION OF STANDARD DEVIATION FROM DISTRIBUTION OF "ACTUAL" EARNINGS (7 CITIES AND 20 INDUSTRIES COMBINED): 1919

ASSUMED EARNINGS (MIDPOINT OF CLASS INTERVAL)	Number of wage earners[1] (f)	Deviation from arbitrary origin (d.)	fd.	$f(d.)^2$
$150	3,297	−12	−39,564	474,768
$350	1,616	−11	−17,776	195,536
$450	4,614	−10	−46,140	461,400
$550	12,272	−9	−110,448	994,032
$650	13,690	−8	−109,520	876,160
$750	28,913	−7	−202,391	1,416,737
$850	27,349	−6	−164,094	984,564
$950	26,157	−5	−130,785	653,925
$1,050	30,283	−4	−121,132	484,528
$1,150	25,356	−3	−76,068	228,204
$1,250	34,842	−2	−69,684	139,368
$1,350	46,288	−1	−46,288	46,288
$1,450	59,592	0	0	0
$1,550	41,613	1	41,613	41,613
$1,650	17,983	2	35,966	71,932
$1,750	14,081	3	42,243	126,729
$1,850	10,265	4	41,060	164,240
$1,950	7,015	5	35,075	175,375
$2,050	11,197	6	67,182	403,092
$2,150	2,571	7	17,997	125,979
$2,250	1,352	8	10,816	86,528
$2,350	1,677	9	15,093	135,837
$2,450	1,134	10	11,340	113,400
$2,550	554	11	6,094	67,034
$2,650	876	12	10,512	126,144
$2,750	553	13	7,189	93,457
$2,850	438	14	6,132	85,848
$2,950	201	15	3,015	45,225
$3,500	1,210	16	19,360	309,760
Total	426,989	.....	−763,203	9,127,703

[1] From the figures of this and the preceding column is derived a weighted, mean amount of earnings of $1,272.

Returning again to the tally sheet reproduced in Table 169, it will be seen that after computation of cumulative percentages, it is quite easy to pick out real or full-time earnings in the median concern in the array. Similarly, quartiles and decils can be picked out, and these percentile scales of earnings show not only an average of earnings (namely, the median) but indicate in addition the range of variation of earnings from this average. It is from tally sheets like that of Table 169 that the decil and median items are drawn for the different city and industry groups to form such percentile distributions as are shown in Tables 116 and 117.

LIMITATIONS OF THE STATISTICAL UNIT EMPLOYED

The foregoing explanation of the procedure followed will, perhaps, make somewhat clearer the nature and shortcomings of the statistical unit in the resulting frequency tables and percentile arrays. Certainly there would be no misgivings whatever if the unit in our arrays were the amount of earnings, full-time or actual, received by the individual employees. The unit, however, is actually something very different. The unit which underlies all of the tables which present the result of this analysis of variability is that ubiquitous average which we have called "census average wage."[1] It is very hard to say just how serious a matter this is; the seriousness of it evidently must depend in part upon the range of individual variation represented by each *establishment* average. Whatever validity there may be in the method which we have used would seem to depend upon the truth of the assumption that in a plant where the average earnings are low, the general run of earnings received by its employees must also be proportionately low. Of course, it is not likely to be true that all of the wage earners in an establishment where the average wage payment is $1,000 received lower earnings than any of the employees in another establishment where that average is $1,500. Obviously, the ranges covered by the two wage amounts overlap, the lower ranges of individual variation in the establishment having a higher average wage payment overlapping upon the higher individual variations of the establishment having a lower average wage payment. All of this means, of course, that the median item in our arrays are establishment items; and there is perhaps scarcely more than a sporting chance that the median wage earner, if the truth were known, is actually employed in the median establishment. But the notion does not seem entirely grotesque that the probabilities are that the median employee in any group would be found in the establishment making the median wage. The employees receiving the median earnings amount would certainly be much more likely to be employed

[1] See initial paragraph, Ch. XIII, p. 269.

in an establishment in or near the median establishment than they would be likely to be employed in a plant at one or the other of the extremes of the earnings scale. It would be very improbable that the median employee (if he existed) would be employed in an establishment the average of whose wage payments is extraordinarily high. It would seem a fair statement then to say that the distribution of the individual earnings can be roughly shown by the distribution of establishments arrayed according to the size of their average wage payments. How widely different the result would be if it were possible to make the unit in our frequency table or percentile arrays the amount earned by each individual employee it is impossible to say.

Part VI

BASIC TABLES

TABLE A.—NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED PER CAPITA "FULL-TIME EARNINGS," BY SELECTED INDUSTRIES, CENSUS YEARS: 1899 TO 1925

INDUSTRY, DIVISION, AND CITY	Census year	Wage earners (average number)	Wages	Census average wage	ESTIMATED FULL-TIME EARNINGS	
					Male	Female
Bread and other bakery products	1925	160,411	$219,606,219	$1,369	$1,721	$810
	1923	162,613	214,578,951	1,320	1,652	778
	1921	148,500	196,938,825	1,326	1,665	785
	1919	141,592	158,237,059	1,118	1,399	660
	1914	124,052	76,866,613	620	773	364
	1909	100,216	59,351,386	592	740	348
	1904	81,278	43,172,000	531	667	314
	1899	60,192	27,864,024	463	579	272
Flour-mill and gristmill products	1925	31,988	39,700,239	1,241	1,441	.....
	1923	35,194	41,704,297	1,185	1,377	.....
	1921	35,378	43,142,734	1,219	1,411	.....
	1919	45,481	50,888,383	1,119	1,294	.....
	1914	39,718	24,593,162	619	718	.....
	1909	39,453	21,464,386	544	629	.....
	1904	39,110	19,822,196	507	588	.....
	1899	32,226	16,285,163	505	582	.....
Confectionery [1]	1925	63,600	55,234,527	868	1,716	796
	1923	63,485	54,881,549	864	1,709	783
	1921	61,004	50,210,101	823	1,628	754
	1919	76,493	54,461,057	713	1,411	654
	1914	51,610	20,643,633	400	792	367
	1909	44,638	15,615,388	350	690	319
	1904	36,239	11,699,257	323	638	296
	1899	26,866	8,020,453	299	594	275
Slaughtering and meat packing	1925	120,422	159,355,189	1,323	1,655	.....
	1923	132,792	167,569,106	1,262	1,581	.....
	1921	117,042	152,902,633	1,306	1,634	.....
	1919	160,996	209,489,263	1,301	1,627	.....
	1914	98,832	62,135,722	629	790	.....
	1909	87,813	50,404,454	574	722	.....
	1904	74,134	40,326,972	544	681	.....
	1899	68,386	33,392,253	488	613	.....
Liquors, malt	[2] 1923	11,212	17,226,271	1,536	1,640	.....
	[2] 1921	18,551	29,365,944	1,583	1,687	.....
	1919	34,259	45,170,432	1,318	1,403	.....
	1914	62,070	53,243,743	858	912	.....
	1909	54,579	41,205,761	755	805	.....
	1904	48,139	34,542,897	718	767	.....
	1899	39,459	25,776,468	653	690	.....
Mineral and soda waters	[3] 1925	27,384	36,053,279	1,317	.....	.....
	1923	18,062	20,462,839	1,133	1,183	599
	1921	14,651	16,286,025	1,112	1,159	589
	1919	17,440	16,393,477	940	975	495
	1914	15,506	8,863,654	572	593	301
	1909	13,147	6,902,054	525	545	277
	1904	10,879	5,487,901	504	524	266
	1899	8,788	4,079,770	464	482	245
Tobacco, cigars and cigarettes	1925	117,108	99,373,421	850	1,162	645
	1923	130,036	107,723,504	828	1,135	630
	1921	133,357	108,161,040	811	1,106	614
	1919	138,773	111,313,348	802	1,094	608
	1914	152,892	68,306,398	447	648	360
	1909	139,578	60,431,949	433	586	326
	1904	135,418	55,864,978	413	564	313
	1899	103,365	40,865,510	395	536	297

[1] The figures for this industry include ice cream and chewing gum for the census years 1899, 1904, and 1909; thereafter these two items are excluded.
[2] Nonalcoholic cereal beverages.
[3] Includes nonalcoholic cereal beverages, which were not tabulated separately.

TABLE A.—NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED PER CAPITA "FULL-TIME EARNINGS," BY SELECTED INDUSTRIES, CENSUS YEARS: 1899 TO 1925—Continued

INDUSTRY, DIVISION, AND CITY	Census year	Wage earners (average number)	Wages	Census average wage	ESTIMATED FULL-TIME EARNINGS	
					Male	Female
Carpets and rugs, other than rag	1925	33,886	$43,382,517	$1,280	$1,804	$1,156
	1923	35,217	48,528,430	1,378	1,933	1,239
	1921	22,922	28,705,036	1,252	1,763	1,130
	1919	22,933	24,216,121	1,056	1,484	951
	1914	31,309	14,715,615	470	657	421
	1909	33,307	15,536,050	466	652	418
	1904	33,221	13,724,233	413	582	373
	1899	28,411	11,121,383	391	547	350
Shirts	1925	49,864	35,673,731	715	1,387	754
	1923	51,672	37,943,405	734	1,423	775
	1921	45,427	33,182,332	730	1,417	771
	1919	39,603	25,833,855	652	1,261	688
	1914	51,972	19,169,697	369	711	387
	1909	48,513	16,632,398	343	664	361
	1904 [2]	36,499	11,233,000	308	598	325
	1899	36,622	10,894,000	297	574	312
Clothing, men's	1925	174,332	203,847,350	1,169	2,083	972
	1923	194,820	235,486,958	1,209	2,157	1,005
	1921	165,206	201,881,511	1,222	2,180	1,016
	1919	175,270	197,821,990	1,129	2,017	940
	1914	173,747	86,828,011	500	893	416
	1909	191,183	89,644,921	469	833	389
	1904	137,190	57,255,506	417	744	347
	1899	120,927	45,496,728	376	670	312
Clothing, women's	1925	126,466	175,044,511	1,384	2,319	1,224
	1923	133,195	176,445,518	1,325	2,224	1,173
	1921	144,865	185,082,108	1,278	2,140	1,130
	1919	165,649	195,295,834	1,179	1,970	1,041
	1914	168,907	92,573,642	548	911	481
	1909	153,743	78,568,281	511	852	450
	1904	115,705	51,180,193	442	741	391
	1899	83,739	32,586,101	389	652	344
Cotton manufactures	1925	468,352	377,050,166	805	1,193	932
	1923	495,197	420,644,486	849	1,260	987
	1921	425,817	340,749,598	800	1,184	926
	1919	446,852	368,723,712	825	1,220	954
	1914	393,404	152,422,599	387	574	449
	1909	378,880	132,859,145	351	520	406
	1904	315,874	96,205,796	305	452	353
	1899	302,861	86,689,752	286	425	332
Dyeing and finishing textiles, exclusive of that done in textile mills	1925	70,749	83,963,377	1,187	1,548	936
	1923	63,414	72,524,711	1,144	1,500	905
	1921	51,510	58,138,729	1,129	1,475	891
	1919	55,985	57,189,978	1,022	1,327	802
	1914	48,467	24,872,318	513	664	401
	1909	44,046	21,226,924	482	624	377
	1904	35,565	15,469,205	435	567	343
	1899	29,776	12,726,316	427	556	336
Knit goods	1925	136,668	168,382,840	996	1,461	980
	1923	194,244	168,271,584	866	1,397	938
	1921	161,880	132,190,349	816	1,318	884
	1919	172,572	125,199,820	725	1,170	785
	1914	150,520	59,758,151	397	639	429
	1909	129,275	44,740,223	346	556	373
	1904	104,092	31,615,000	304	492	330
	1899	83,691	24,434,000	292	472	317
Silk goods, including throwsters	1925	132,509	142,733,539	1,077	1,984	1,172
	1923	125,234	126,849,454	1,013	1,856	1,094
	1921	121,378	113,395,626	934	1,717	1,014
	1919	126,782	108,226,330	854	1,569	926
	1914	108,170	47,108,469	436	797	470
	1909	99,037	38,570,086	389	710	419
	1904	79,601	26,767,943	336	618	365
	1899	65,416	20,982,194	321	587	346

TABLE A.—NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED PER CAPITA "FULL-TIME EARNINGS," BY SELECTED INDUSTRIES, CENSUS YEARS: 1899 TO 1925—Continued

INDUSTRY, DIVISION, AND CITY	Census year	Wage earners (average number)	Wages	Census average wage	ESTIMATED FULL-TIME EARNINGS	
					Male	Female
Woolen and worsted goods	1925	165,224	$191,270,791	$1,158	$1,623	$1,163
	1923	194,552	222,984,522	1,146	1,530	1,097
	1921	162,364	174,894,768	1,077	1,422	1,021
	1919	166,787	168,108,681	1,008	1,330	955
	1914	158,692	75,953,444	479	629	452
	1909	163,192	69,727,046	427	563	404
	1904	141,998	55,097,343	388	512	367
	1899	125,901	44,849,744	356	470	338
Boots and shoes, not including rubber boots and shoes.	1925	206,992	225,787,981	1,091	1,652	1,057
	1923	225,216	250,345,922	1,112	1,683	1,076
	1921	183,502	204,954,095	1,117	1,686	1,079
	1919	211,049	210,734,610	999	1,505	963
	1914	191,555	105,695,404	552	829	530
	1909	185,116	92,359,152	499	752	481
	1904	149,924	69,059,680	461	697	446
	1899	141,830	58,440,883	412	620	397
Leather, tanned, curried, and finished	1925	53,043	66,762,077	1,259	1,503	----
	1923	59,703	73,784,340	1,236	1,469	----
	1921	48,955	57,740,510	1,179	1,406	----
	1919	72,476	88,205,473	1,217	1,451	----
	1914	55,936	31,914,497	571	677	----
	1909	62,202	32,132,845	516	616	----
	1904	57,239	27,049,152	473	565	----
	1899	52,109	22,591,091	434	514	----
Furniture	1925	180,895	225,200,027	1,245	1,777	----
	1923	168,089	204,513,092	1,217	1,729	----
	1921	122,253	141,239,832	1,154	1,648	----
	1919	138,331	141,116,316	1,020	1,454	----
	1914	127,881	71,815,916	562	801	----
	1909	123,426	62,935,245	510	724	----
	1904	110,133	49,883,235	453	646	----
	1899	87,262	35,632,523	408	581	----
Lumber and timber products	1925	473,998	456,715,665	964	1,154	----
	1923	495,932	475,962,443	960	1,153	----
	1921	364,247	313,486,957	861	1,030	----
	1919	480,945	488,419,091	1,018	1,220	----
	1914	479,786	239,976,562	500	596	----
	1909	547,178	238,866,806	437	520	----
	1904	404,563	182,949,649	452	542	----
	1899	413,257	147,951,886	358	428	----
Lumber, planing-mill products, not including planing mills connected with sawmills.	1925	111,329	146,592,039	1,317	1,661	----
	1923	103,008	133,328,599	1,294	1,622	----
	1921	78,033	95,954,153	1,230	1,549	----
	1919	86,956	91,976,526	1,058	1,327	----
	1914	96,214	61,949,230	644	811	----
	1909	112,392	64,536,409	574	719	----
	1904	97,674	50,713,607	519	654	----
	1899	73,510	32,621,704	444	556	----
Paper and wood pulp	1925	123,842	160,145,932	1,293	1,471	----
	1923	120,677	151,476,693	1,255	1,418	----
	1921	105,294	127,028,767	1,206	1,373	----
	1919	113,759	135,690,642	1,193	1,350	----
	1914	88,457	53,245,639	602	683	----
	1909	75,978	40,804,502	537	606	----
	1904	65,964	32,019,212	485	551	----
	1899	49,646	20,746,426	418	474	----
Printing and publishing, book and job	1925	133,316	219,830,346	1,649	2,174	1,099
	1923	129,890	201,216,502	1,549	2,066	1,027
	1921	121,055	181,065,572	1,496	1,977	998
	1919	123,005	141,476,243	1,150	1,516	766
	1914	113,121	78,413,700	693	908	459
	1909	108,687	66,521,316	612	806	407
	1904	87,746	48,720,854	555	732	370
	1899	67,610	33,541,701	496	652	329

TABLE A.—NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED PER CAPITA "FULL-TIME EARNINGS," BY SELECTED INDUSTRIES, CENSUS YEARS: 1899 TO 1925—Continued

INDUSTRY, DIVISION, AND CITY	Census year	Wage earners (average number)	Wages	Census average wage	ESTIMATED FULL-TIME EARNINGS	
					Male	Female
Printing and publishing, newspapers and periodicals.	1925	117,001	$217,540,967	$1,859	$2,236	$1,008
	1923	115,646	196,804,325	1,702	2,042	918
	1921	107,534	174,358,525	1,621	1,946	878
	1919	120,381	144,348,173	1,199	1,442	650
	1914	114,375	88,561,248	774	928	418
	1909	108,672	74,401,593	685	818	369
	1904	96,857	59,821,000	618	743	335
	1899	94,604	50,333,000	532	639	288
Chemicals	1925	55,694	80,434,642	1,444	1,558	------
	1923	74,897	99,845,388	1,333	1,433	------
	1921	46,306	58,023,943	1,253	1,353	------
	1919	55,586	72,848,324	1,311	1,411	------
	1914	32,311	22,066,212	683	733	------
	1909	23,729	14,095,923	594	641	------
	1904	19,847	10,813,758	544	588	------
	1899	15,163	7,389,621	------	------	------
Petroleum refining	1925	65,324	104,645,391	1,602	1,800	------
	1923	66,717	103,833,760	1,556	1,744	------
	1921	63,189	102,294,108	1,619	1,819	------
	1919	58,889	89,749,637	1,524	1,705	------
	1914	25,366	19,397,466	765	856	------
	1909	13,929	9,830,078	706	789	------
	1904	16,770	9,989,367	596	669	------
	1899	12,199	6,717,087	551	615	------
Brick and tile, pottery, terra-cotta, and fire-clay products.	1925	139,313	173,896,352	1,248	1,559	------
	1923	139,547	170,479,309	1,222	1,525	------
	1921	97,217	109,081,494	1,122	1,401	------
	1919	104,849	108,076,363	1,031	1,287	------
	1914	126,987	71,573,748	564	703	------
	1909	132,696	66,892,079	504	629	------
	1904	118,449	53,823,670	454	567	------
	1899	105,693	39,575,070	374	465	------
Glass	1925	60,371	86,735,571	1,250	1,755	574
	1923	73,335	89,897,948	1,226	1,739	568
	1921	54,748	68,224,248	1,246	1,755	573
	1919	77,520	87,526,625	1,129	1,583	517
	1914	74,502	48,655,819	653	919	300
	1909	68,911	39,299,624	570	796	260
	1904	63,969	37,288,148	583	820	268
	1899	52,818	27,084,710	513	713	233
Iron and steel, blast furnaces	1925	29,188	45,312,168	1,552	1,946	------
	1923	36,712	58,935,384	1,605	2,020	------
	1921	18,698	29,369,685	1,571	1,972	------
	1919	41,660	73,769,395	1,771	2,216	------
	1914	29,356	22,780,626	776	969	------
	1909	38,429	24,606,530	640	800	------
	1904	35,078	18,935,513	540	678	------
	1899	39,241	18,484,000	471	590	------
Iron and steel, steel works and rolling mills.	1925	370,726	614,984,982	1,659	2,102	------
	1923	388,201	637,825,137	1,643	2,096	------
	1921	235,515	324,987,239	1,380	1,751	------
	1919	375,088	637,637,430	1,700	2,155	------
	1914	248,716	188,142,398	756	958	------
	1909	240,076	163,200,758	680	860	------
	1904	207,562	122,491,993	590	748	------
	1899	183,249	102,335,876	558	703	------
Foundry and machine-shop products [1]	1925	397,838	590,801,237	1,485	2,103	------
	1923	448,777	642,431,394	1,432	2,022	------
	1921	321,363	412,359,408	1,283	1,820	------
	1919	482,767	622,571,129	1,290	1,828	------
	1914	362,471	244,146,380	674	954	------
	1909	388,911	239,802,873	617	874	------
	1904	402,914	229,869,297	571	809	------
	1899	350,327	182,232,009	520	736	------

[1] For 1909 the figures are for "Foundry and machine-shop products, not elsewhere classified." The census mean-wage payment for all "Foundry and machine-shop products" for 1909 is $605.

TABLE A.—NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED PER CAPITA "FULL-TIME EARNINGS," BY SELECTED INDUSTRIES, CENSUS YEARS: 1899 TO 1925—Continued

INDUSTRY, DIVISION, AND CITY	Census year	Wage earners (average number)	Wages	Census average wage	ESTIMATED FULL-TIME EARNINGS	
					Male	Female
Smelting and refining, copper, lead, and zinc.	1925	32,992	$47,947,907	$1,453	$1,461	.....
	1923	38,847	56,983,332	1,467	1,484	.....
	1921	18,580	24,401,000	1,313	1,318	.....
	1919	37,579	52,686,264	1,402	1,409	.....
	1914	34,733	25,983,145	934	939	.....
	1909	29,707	23,036,712	775	779	.....
	1904	26,853	20,058,200	747	749	.....
	1899	24,512	15,973,626	652	652	.....
Automobile bodies and parts [5]	1925	228,382	372,720,933	1,632	1,812	.....
	1923	163,530	253,147,058	1,548	1,709	.....
	1921	69,119	96,779,079	1,400	1,554	.....
	1919	132,556	178,955,503	1,350	1,495	.....
	1914	47,735	34,992,515	732	810	.....
	1909	24,427	15,513,393	635	702	.....
	1904	1,810	980,008	541	600	.....
Automobiles	1925	197,728	341,210,401	1,726	2,031	.....
	1923	241,356	406,730,278	1,685	1,989	.....
	1921	143,658	221,973,586	1,545	1,818	.....
	1919	210,559	312,165,870	1,483	1,739	.....
	1914	79,307	66,934,359	844	987	.....
	1909	51,294	33,180,474	647	759	.....
	1904	10,239	6,178,960	603	710	.....
	1899	2,241	1,320,658	589	689	.....
Cars, steam-railroad, not including operations of railroad companies. [6]	1925	47,873	73,384,642	1,533	1,790	.....
	1923	76,612	123,297,237	1,609	1,872	.....
	1921	45,121	67,745,689	1,501	1,748	.....
	1919	52,298	78,264,847	1,497	1,741	.....
	1914	54,288	41,393,579	762	888	.....
	1909	43,086	27,135,222	630	728	.....
	1904	34,058	20,247,821	595	694	.....
	1899	33,453	16,987,294	508	590	.....
Cars and general shop construction and repairs by electric-railroad companies.	1925	32,521	48,357,386	1,487	1,886	.....
	1923	34,925	49,225,583	1,409	1,790	.....
	1921	33,279	47,775,235	1,436	1,822	.....
	1919	31,272	39,073,154	1,249	1,580	.....
	1914	26,384	18,644,845	707	895	.....
	1909	22,418	14,486,009	646	814	.....
	1904	11,052	7,012,798	635	806	.....
	1899	7,025	4,404,593	627	790	.....
Cars and general shop construction and repairs by steam-railroad companies.	1925	425,234	619,834,382	1,458	1,849	.....
	1923	438,505	723,742,539	1,482	1,882	.....
	1921	385,006	624,180,594	1,621	2,056	.....
	1919	484,437	687,617,312	1,419	1,797	.....
	1914	339,518	234,505,098	691	876	.....
	1909	282,174	181,344,296	643	815	.....
	1904	236,870	142,153,000	600	761	.....
	1899	173,595	96,007,000	553	701	.....
Agricultural implements	1925	28,696	37,387,620	1,303	1,630	.....
	1923	30,962	40,510,534	1,308	1,637	.....
	1921	30,359	39,835,414	1,312	1,637	.....
	1919	54,368	66,704,434	1,227	1,531	.....
	1914	43,459	34,593,325	714	891	.....
	1909	50,551	28,608,615	566	706	.....
	1904	47,394	25,002,650	528	660	.....
	1899	46,582	22,450,080	482	601	.....

[5] No data for 1899.

[6] At the census for 1925 the figures for manufacture of steam-railroad cars were not tabulated separately from corresponding figures for electric-railroad cars. The figures here given are derived, after examination of the proportions in earlier census years between wages and wage earners in steam-car building on the one hand and wages and wage earners in electric-car building on the other, on the basis of the assumption that the ratio between the respective amounts in the 2 industries are as 1 for electric-car building to 20 for steam-car building.

TABLE A.—NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED PER CAPITA "FULL-TIME EARNINGS," BY SELECTED INDUSTRIES, CENSUS YEARS: 1899 TO 1925—Continued

INDUSTRY, DIVISION, AND CITY	Census year	Wage earners (average number)	Wages	Census average wage	ESTIMATED FULL-TIME EARNINGS	
					Male	Female
Rubber tires, tubes, and rubber goods, not elsewhere specified	1925	116,122	$162,504,972	$1,399	$2,374	.....
	1923	108,433	148,418,246	1,369	2,168	.....
	1921	76,378	97,077,161	1,271	2,041	.....
	1919	119,848	156,806,828	1,308	2,105	.....
	1914	50,220	31,278,755	623	999	.....
	1909	26,521	14,119,848	532	856	.....
	1904	21,184	9,412,368	444	713	.....
	1899	20,404	8,081,803	396	635	.....
Shipbuilding, steel	1925	38,308	56,686,531	1,480	1,677	.....
	1923	51,961	76,370,079	1,470	1,663	.....
	1921	86,323	137,122,187	1,489	1,663	.....
	1919	344,014	538,372,576	1,565	1,765	.....
	1914	83,508	25,166,792	751	844	.....
	1909	28,143	17,215,176	612	691	.....
	1904	36,742	20,809,908	566	640	.....
	1899	30,906	16,231,000	525	589	.....
Electrical machinery, apparatus, and supplies	1925	239,921	323,834,541	1,350	1,684	$911
	1923	234,892	305,465,268	1,300	1,627	877
	1921	161,204	194,242,357	1,205	1,506	815
	1919	212,374	238,188,852	1,122	1,401	758
	1914	118,078	73,806,329	625	776	420
	1909	87,256	49,381,145	566	704	381
	1904	60,466	31,841,521	527	658	356
	1899	42,013	20,579,194	490	603	327

TABLE B.—NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, AND CENSUS AVERAGE WAGE, BY GENERAL GROUPS OF INDUSTRIES: 1899–1921 [1]

GROUP	Census year	Wage earners	Wages	Census average wage
All industries	1921	6,946,570	$8,202,324,339	$1,181
	1919	9,096,372	10,533,400,340	1,158
	1914	7,036,247	4,078,382,453	580
	1909	6,615,046	3,427,037,384	518
	1904	5,468,383	2,610,444,953	477
	1899	4,712,763	2,008,361,119	426
Food and kindred products	1921	568,733	667,060,301	1,173
	1919	684,672	722,539,843	1,055
	1914	496,234	278,009,375	560
	1909	411,575	208,663,293	507
	1904	354,046	164,510,641	465
	1899	301,968	125,196,412	415
Textiles and their products	1921	1,510,875	1,473,368,670	975
	1919	1,611,309	1,482,326,820	920
	1914	1,507,374	676,459,736	449
	1909	1,445,720	595,243,129	412
	1904	1,168,497	422,570,250	363
	1899	1,025,706	346,923,166	334
Iron and steel and their products	1921	1,031,522	1,320,364,278	1,280
	1919	1,585,712	2,193,205,301	1,383
	1914	1,061,058	723,162,395	682
	1909	1,026,553	635,322,501	619
	1904	868,634	488,598,000	562
	1899	745,235	387,589,641	520
Lumber and its remanufactures	1921	675,067	660,040,364	978
	1919	939,008	947,031,570	1,010
	1914	833,529	440,308,223	528
	1909	911,566	424,759,396	466
	1904	734,136	336,046,449	456
	1899	671,696	253,176,000	377

[1] Due to change in groupings, no comparable statistics can be given for 1923, 1925, or 1927.

TABLE B.—NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, AND CENSUS AVERAGE WAGE, BY GENERAL GROUPS OF INDUSTRIES: 1899–1921[1]—Continued

GROUP	Census year	Wage earners	Wages	Census average wage
Leather and its finished products	1921	280,070	$314,411,672	$1,123
	1919	349,362	563,453,419	1,040
	1914	307,060	169,357,560	552
	1909	309,766	155,110,878	501
	1904	264,459	120,833,174	457
	1899	248,626	101,503,379	408
Paper and printing	1921	467,074	637,128,188	1,364
	1919	509,875	564,509,917	1,107
	1914	452,900	296,491,824	655
	1909	415,990	242,062,243	582
	1904	351,640	186,422,106	530
	1899	298,744	140,754,185	471
Liquors and beverages	1921	35,374	48,619,757	1,374
	1919	55,442	66,139,716	1,193
	1914	88,152	69,123,819	784
	1909	77,827	53,501,779	687
	1904	68,338	45,143,885	661
	1899	55,120	33,217,604	603
Chemicals and allied products	1921	329,473	401,679,011	1,219
	1919	427,008	493,744,382	1,156
	1914	299,569	167,494,367	559
	1909	267,261	129,063,274	483
	1904	227,326	102,388,000	450
	1899	196,538	77,559,918	395
Stone, clay, and glass products	1921	250,811	304,931,433	1,216
	1919	298,659	328,559,462	1,100
	1914	334,612	205,419,894	614
	1909	342,827	189,256,482	552
	1904	285,346	148,458,000	520
	1899	231,716	102,846,099	444
Metals and metal products, other than iron and steel	1921	235,171	281,064,683	1,195
	1919	339,469	394,627,827	1,162
	1914	262,154	166,894,654	637
	1909	249,607	146,793,608	588
	1904	198,531	110,208,073	555
	1899	161,463	81,974,056	508
Tobacco manufactures	1921	149,985	120,908,492	806
	1919	157,097	123,988,084	789
	1914	178,872	77,856,100	435
	1909	166,810	69,354,594	416
	1904	159,406	62,639,000	393
	1899	132,526	47,975,331	362
Vehicles for land transportation	1921	281,350	412,715,263	1,467
	1919	495,939	689,475,462	1,390
	1914	263,076	197,077,133	749
	1909	202,719	121,047,239	597
	1904	136,625	72,659,383	532
	1899	133,663	63,231,652	473
Railroad repair shops	1921	418,285	671,955,829	1,606
	1919	515,709	726,690,466	1,409
	1914	365,902	253,149,943	692
	1909	304,592	195,830,305	643
	1904	247,922	149,166,134	602
	1899	180,620	100,411,322	556
Miscellaneous industries	1921	712,774	888,081,398	1,246
	1919	1,227,111	1,537,110,071	1,253
	1914	585,755	357,527,210	610
	1909	482,206	261,089,163	541
	1904	408,477	201,802,858	494
	1899	326,242	149,002,354	457

[1] Due to change in groupings, no comparable statistics can be given for 1923, 1925, or 1927.

TABLE C.—AVERAGE NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED FULL-TIME PER CAPITA EARNINGS, BY GEOGRAPHIC DIVISIONS AND STATES: 1899 TO 1925

DIVISION AND STATE	Census year	Average number of wage earners	Wages	Census average wage	Estimated full-time per capita earnings (male)
United States (all industries)	1925	8,384,261	$10,729,968,927	$1,280	$1,582
	1923	8,778,156	11,009,267,726	1,267	1,566
	1921	6,946,570	8,202,324,000	1,180	1,462
	1919	9,096,372	10,533,400,340	1,158	1,433
	1914	7,036,247	4,078,382,453	580	719
	1909	6,615,046	3,427,037,884	518	643
	1904	5,468,883	2,610,444,963	477	590
	1899	4,712,763	2,008,361,000	426	525
GEOGRAPHIC DIVISIONS					
New England	1925	1,122,216	1,339,309,628	1,193	
	1923	1,254,496	1,472,315,452	1,174	1,396
	1921	1,071,849	1,161,291,000	1,084	1,291
	1919	1,351,389	1,436,436,587	1,063	1,263
	1914	1,140,283	628,408,940	551	651
	1909	1,101,240	557,630,525	506	601
	1904	940,762	439,050,282	467	556
	1899	851,903	367,674,000	432	512
Middle Atlantic	1925	2,491,039	3,434,610,227	1,379	
	1923	2,694,027	3,595,238,497	1,335	1,774
	1921	2,246,104	2,768,748,000	1,233	1,609
	1919	2,872,553	3,464,931,287	1,206	1,474
	1914	2,355,940	1,370,130,988	582	709
	1909	2,207,747	1,182,567,562	536	655
	1904	1,805,565	926,144,542	491	601
	1899	1,604,544	729,365,000	454	553
East North Central	1925	2,342,799	3,345,893,689	1,428	
	1923	2,397,049	3,393,620,741	1,397	1,798
	1921	1,710,539	2,214,127,000	1,294	1,662
	1919	2,396,516	2,992,880,744	1,249	1,604
	1914	1,680,261	1,072,537,914	638	815
	1909	1,503,764	827,152,163	546	698
	1904	1,224,528	615,543,654	503	647
	1899	1,073,322	473,040,000	441	562
West North Central	1925	452,820	552,702,481	1,221	
	1923	469,726	563,914,123	1,201	1,511
	1921	384,797	476,315,000	1,238	1,555
	1919	499,635	546,172,567	1,093	1,371
	1914	381,565	235,471,289	617	775
	1909	374,537	204,792,232	547	686
	1904	312,361	157,842,531	506	635
	1899	266,051	117,309,000	441	552
South Atlantic	1925	838,834	757,050,696	903	
	1923	882,016	729,558,525	827	1,091
	1921	646,207	564,943,000	874	1,067
	1919	817,212	778,026,847	952	1,183
	1914	655,252	293,062,940	428	531
	1909	663,015	244,377,580	369	496
	1904	522,611	175,460,785	336	418
	1899	458,344	130,564,000	286	356
East South Central	1925	355,995	322,675,043	906	
	1923	347,200	310,566,506	894	1,111
	1921	259,256	225,321,000	869	1,078
	1919	329,228	298,710,318	907	1,125
	1914	264,378	117,986,768	446	551
	1909	261,772	102,191,252	390	480
	1904	221,229	83,941,797	379	471
	1899	177,308	56,008,000	316	391
West South Central	1925	265,160	267,575,216	1,010	
	1923	267,111	265,331,525	993	1,152
	1921	228,549	228,043,000	1,037	1,206
	1919	285,244	268,021,563	1,027	1,189
	1914	221,940	105,128,511	548	636
	1909	204,520	97,646,349	477	549
	1904	145,470	67,127,729	468	543
	1899	113,388	42,715,000	377	435

TABLE C.—AVERAGE NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED FULL-TIME PER CAPITA EARNINGS, BY GEOGRAPHIC DIVISIONS AND STATES: 1899 TO 1925—Continued

DIVISION AND STATE	Census year	Average number of wage earners	Wages	Census average wage	Estimated full-time per capita earnings (male)
GEOGRAPHIC DIVISIONS—Continued					
Mountain	1925	100,374	$134,583,152	$1,341	----------
	1923	106,060	147,278,510	1,389	$1,661
	1921	82,000	118,577,000	1,446	1,713
	1919	109,216	141,900,942	1,299	1,546
	1914	81,113	66,357,823	818	971
	1909	75,435	56,870,162	754	892
	1904	52,790	39,046,218	740	883
	1899	44,497	27,714,000	623	742
Pacific	1925	415,024	575,268,793	1,386	----------
	1923	420,472	591,386,845	1,406	1,717
	1921	316,019	432,959,000	1,370	1,677
	1919	435,179	581,269,395	1,336	1,629
	1914	235,515	178,247,310	757	926
	1909	213,166	153,809,779	722	907
	1904	164,077	106,187,485	647	791
	1899	123,206	63,777,000	518	633
NEW ENGLAND					
Maine	1925	73,849	79,777,217	1,080	----------
	1923	83,328	91,854,368	1,102	1,368
	1921	75,710	83,429,000	1,102	1,368
	1919	88,651	94,225,346	1,063	1,319
	1914	82,149	43,253,703	527	654
	1909	79,955	37,632,284	471	584
	1904	74,958	32,691,759	436	541
	1899	69,914	25,731,000	368	454
New Hampshire	1925	66,658	71,725,465	1,076	----------
	1923	75,314	79,073,889	1,050	1,290
	1921	67,416	67,893,000	1,007	1,233
	1919	83,074	79,326,341	955	1,170
	1914	78,993	40,642,393	515	629
	1909	78,658	36,200,262	460	562
	1904	65,366	27,693,203	424	520
	1899	67,646	25,850,000	382	468
Vermont	1925	27,563	32,326,006	1,173	----------
	1923	30,783	34,695,484	1,127	1,309
	1921	25,767	28,068,000	1,089	1,261
	1919	33,491	34,083,935	1,018	1,181
	1914	32,704	18,617,075	569	659
	1909	33,788	17,271,702	511	591
	1904	33,106	15,221,059	459	532
	1899	28,179	11,426,000	405	468
Massachusetts	1925	591,438	716,155,593	1,211	----------
	1923	667,172	799,363,111	1,198	1,405
	1921	579,071	641,361,000	1,108	1,299
	1919	713,836	766,623,337	1,074	1,260
	1914	606,698	341,309,517	563	658
	1909	584,559	301,173,464	515	602
	1904	488,399	232,388,946	476	557
	1899	438,234	195,278,000	446	524
Rhode Island	1925	120,346	138,125,781	1,148	----------
	1923	134,667	152,499,859	1,132	1,354
	1921	112,745	119,414,000	1,059	1,264
	1919	139,665	137,495,377	984	1,174
	1914	113,425	59,366,292	523	624
	1909	113,538	55,234,068	487	582
	1904	97,318	43,112,637	443	529
	1899	88,197	35,995,000	408	487
Connecticut	1925	242,362	301,199,566	1,243	----------
	1923	263,232	314,828,741	1,196	1,470
	1921	210,990	221,126,000	1,048	1,291
	1919	292,672	324,682,251	1,109	1,363
	1914	226,264	125,219,860	553	678
	1909	210,792	110,119,045	522	643
	1904	181,605	87,942,628	484	595
	1899	159,733	73,394,000	459	566

TABLE C.—AVERAGE NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED FULL-TIME PER CAPITA EARNINGS, BY GEOGRAPHIC DIVISIONS AND STATES: 1899 TO 1925—Continued

DIVISION AND STATE	Census year	Average number of wage earners	Wages	Census average wage	Estimated full-time per capita earnings (table)
MIDDLE ATLANTIC					
New York	1925	1,366,202	$1,593,838,390	$1,489	
	1923	1,150,801	1,581,348,221	1,374	$1,641
	1921	1,000,414	1,326,421,300	1,801	1,581
	1919	1,228,136	1,435,206,864	1,187	1,413
	1914	1,007,852	591,962,911	597	772
	1909	1,003,891	557,230,559	566	665
	1904	866,947	450,104,551	522	586
	1899	725,405	337,324,300	464	551
New Jersey	1925	426,377	576,255,526	1,355	
	1923	445,069	578,926,575	1,302	1,612
	1921	351,773	463,471,000	1,306	1,504
	1919	368,886	500,568,345	1,191	1,474
	1914	273,805	211,386,460	666	791
	1909	226,223	169,710,036	620	647
	1904	206,358	128,168,301	481	599
	1899	213,975	95,165,000	445	557
Pennsylvania	1925	998,460	1,224,461,011	1,226	
	1923	1,086,187	1,434,962,361	1,340	1,645
	1921	853,017	1,006,556,300	1,185	1,464
	1919	1,135,817	1,406,066,138	1,238	1,554
	1914	824,472	527,852,517	671	773
	1909	677,563	455,626,790	619	683
	1904	763,202	367,960,890	482	606
	1899	668,960	296,576,100	447	563
EAST NORTH CENTRAL					
Ohio	1925	676,742	975,811,976	1,442	
	1923	696,102	979,859,889	1,408	1,805
	1921	494,266	697,033,000	1,288	1,681
	1919	730,737	944,651,734	1,293	1,663
	1914	503,455	317,926,515	628	799
	1909	446,334	245,448,304	549	709
	1904	384,298	162,429,425	501	645
	1899	308,109	135,428,300	443	567
Indiana	1925	280,854	365,005,314	1,300	
	1923	291,131	374,909,629	1,288	1,655
	1921	206,594	251,456,000	1,218	1,599
	1919	277,860	317,042,297	1,142	1,500
	1914	197,563	119,258,329	604	790
	1909	186,894	95,610,615	511	655
	1904	154,174	72,368,399	467	613
	1899	139,017	59,280,000	426	557
Illinois	1925	622,386	897,970,456	1,443	
	1923	646,227	913,220,186	1,414	1,806
	1921	516,876	700,529,000	1,365	1,744
	1919	668,114	891,087,859	1,227	1,562
	1914	506,963	340,016,328	672	854
	1909	455,784	273,818,006	607	749
	1904	379,456	208,406,468	549	700
	1899	302,871	158,104,000	478	609
Michigan	1925	515,494	792,224,893	1,537	
	1923	505,806	769,070,968	1,520	1,960
	1921	394,471	618,968,000	1,570	1,798
	1919	471,242	688,708,033	1,461	1,737
	1914	271,396	192,252,264	672	873
	1909	203,468	118,967,852	514	668
	1904	175,229	81,273,507	464	602
	1899	135,820	62,532,000	401	516
Wisconsin	1925	247,341	374,885,011	1,373	
	1923	247,551	397,160,964	1,199	1,566
	1921	191,770	274,140,000	1,117	1,454
	1919	263,449	290,446,561	1,102	1,402
	1914	194,310	112,153,153	577	749
	1909	182,262	83,904,806	514	669
	1904	151,391	71,471,805	472	624
	1899	127,525	55,696,000	436	568

TABLE C.—AVERAGE NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED FULL-TIME PER CAPITA EARNINGS, BY GEOGRAPHIC DIVISIONS AND STATES: 1899 TO 1925—Continued

DIVISION AND STATE	Census year	Average number of wage earners	Wages	Census average wage	Estimated full-time per capita earnings (male)
WEST NORTH CENTRAL					
Minnesota	1925	100,614	$123,767,442	$1,230	----------
	1923	103,964	125,531,009	1,207	$1,562
	1921	85,804	107,250,000	1,250	1,622
	1919	115,623	127,106,505	1,099	1,422
	1914	92,834	58,507,013	630	814
	1909	84,767	47,470,803	560	728
	1904	69,636	35,843,145	515	668
	1899	64,557	29,029,000	450	581
Iowa	1925	74,976	92,232,591	1,230	----------
	1923	77,847	94,206,205	1,210	1,525
	1921	62,274	78,546,000	1,261	1,590
	1919	80,551	90,117,169	1,119	1,414
	1914	63,113	39,859,510	632	798
	1909	61,635	32,541,931	528	669
	1904	49,481	22,997,053	465	587
	1899	44,420	18,021,000	406	511
Missouri	1925	194,959	230,690,902	1,183	----------
	1923	196,694	228,014,986	1,159	1,461
	1921	156,384	182,897,000	1,170	1,474
	1919	195,037	196,515,353	1,008	1,272
	1914	152,182	89,197,477	586	737
	1909	152,993	80,842,776	528	668
	1904	133,167	66,644,126	500	630
	1899	107,704	46,714,000	434	548
North Dakota	1925	3,261	4,574,698	1,403	----------
	1923	3,552	5,134,350	1,445	1,762
	1921	3,107	4,669,000	1,503	1,833
	1919	4,472	5,401,330	1,208	1,468
	1914	3,275	2,416,235	738	902
	1909	2,789	1,787,405	641	780
	1904	1,755	1,031,307	588	716
	1899	1,358	671,000	494	601
South Dakota	1925	5,151	6,208,088	1,205	----------
	1923	5,146	6,210,607	1,207	1,503
	1921	4,635	6,350,000	1,370	1,701
	1919	6,382	7,905,426	1,239	1,538
	1914	3,788	2,628,152	694	865
	1909	3,602	2,297,512	638	794
	1904	2,492	1,421,680	570	709
	1899	2,224	1,130,000	508	631
Nebraska	1925	27,200	36,021,367	1,324	----------
	1923	31,267	39,760,667	1,272	1,545
	1921	27,655	37,395,000	1,352	1,645
	1919	36,521	46,066,755	1,261	1,532
	1914	25,144	16,893,345	672	819
	1909	24,336	13,947,845	573	694
	1904	20,260	11,022,149	544	660
	1899	18,669	8,842,000	474	575
Kansas	1925	46,659	59,207,393	1,269	----------
	1923	51,255	65,056,299	1,269	1,533
	1921	44,938	59,208,000	1,318	1,591
	1919	61,049	73,060,019	1,197	1,444
	1914	41,259	25,969,537	629	757
	1909	44,215	25,903,960	586	706
	1904	35,570	18,883,071	531	642
	1899	27,119	12,802,000	472	571
SOUTH ATLANTIC					
Delaware	1925	20,704	25,072,302	1,211	----------
	1923	23,116	27,368,652	1,184	1,420
	1921	17,754	19,596,000	1,104	1,325
	1919	29,035	37,265,319	1,283	1,537
	1914	22,155	11,382,160	514	615
	1909	21,238	10,295,596	485	583
	1904	18,475	8,158,203	442	530
	1899	20,562	8,457,000	411	493

TABLE C.—AVERAGE NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED FULL-TIME PER CAPITA EARNINGS, BY GEOGRAPHIC DIVISIONS AND STATES: 1899 TO 1925—Continued

DIVISION AND STATE	Census year	Average number of wage earners	Wages	Census average wage	Estimated full-time per capita earnings (male)
SOUTH ATLANTIC—continued					
Maryland	1925	125,787	$138,590,634	$1,102	
	1923	128,826	136,285,549	1,058	$1,357
	1921	107,085	110,485,000	1,032	1,322
	1919	140,342	147,866,545	1,054	1,347
	1914	111,585	53,792,339	482	620
	1909	107,921	45,435,829	421	541
	1904	94,174	36,144,244	384	492
	1899	94,170	32,414,000	344	443
District of Columbia	1925	9,753	15,320,067	1,571	
	1923	9,823	14,795,722	1,506	1,652
	1921	8,640	12,955,000	1,499	1,385
	1919	10,482	13,189,031	1,258	1,269
	1914	8,877	6,068,692	684	753
	1909	7,707	4,989,449	647	708
	1904	6,299	3,658,370	581	638
	1899	6,155	3,023,000	491	542
Virginia	1925	112,135	105,886,599	944	
	1923	111,578	104,680,099	938	1,187
	1921	88,555	85,063,000	961	1,213
	1919	119,352	120,006,452	1,005	1,270
	1914	102,820	44,873,435	436	550
	1909	105,676	38,154,566	361	457
	1904	80,285	27,943,058	348	440
	1899	66,223	20,274,000	306	387
West Virginia	1925	80,700	105,892,102	1,312	
	1923	85,661	109,936,819	1,283	1,599
	1921	60,536	78,549,000	1,298	1,618
	1919	83,036	101,840,420	1,226	1,527
	1914	71,078	43,784,006	616	770
	1909	63,893	33,000,355	516	644
	1904	43,758	21,153,042	483	601
	1899	33,080	12,640,000	382	475
North Carolina	1925	182,234	134,237,097	737	
	1923	173,687	127,537,821	734	834
	1921	135,833	94,235,000	694	788
	1919	157,659	126,680,099	804	913
	1914	136,844	46,038,447	336	380
	1909	121,473	34,354,625	283	320
	1904	85,339	21,375,294	250	284
	1899	72,322	14,052,000	194	221
South Carolina	1925	100,144	67,061,783	670	
	1923	96,802	64,753,457	669	769
	1921	76,251	51,410,000	674	774
	1919	79,450	62,565,413	787	905
	1914	71,824	24,173,101	337	388
	1909	73,046	20,360,750	279	321
	1904	59,441	13,868,950	233	268
	1899	47,025	9,130,000	194	222
Georgia	1925	141,173	99,210,003	703	
	1923	137,476	92,143,788	670	792
	1921	98,264	69,916,000	712	840
	1919	123,441	101,180,339	820	970
	1914	104,461	38,128,407	365	432
	1909	104,588	34,804,818	333	394
	1904	92,749	27,392,442	295	349
	1899	83,336	19,958,000	239	283
Florida	1925	66,204	65,780,109	994	
	1923	65,047	52,356,618	805	1,111
	1921	53,289	42,734,000	802	1,106
	1919	74,415	67,433,229	906	1,250
	1914	55,608	24,822,323	446	615
	1909	57,473	22,981,572	400	553
	1904	42,091	15,767,182	375	517
	1899	35,471	10,916,000	308	424

TABLE C.—AVERAGE NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED FULL-TIME PER CAPITA EARNINGS, BY GEOGRAPHIC DIVISIONS AND STATES: 1899 TO 1925—Continued

DIVISION AND STATE	Census year	Average number of wage earners	Wages	Census average wage	Estimated full-time per capita earnings (male)
EAST SOUTH CENTRAL					
Kentucky	1925	76,580	$84,945,679	$1,109	----
	1923	76,724	82,647,889	1,077	$1,320
	1921	58,840	62,636,000	1,065	1,305
	1919	69,340	67,033,546	967	1,184
	1914	64,586	31,830,283	493	607
	1909	65,400	27,887,672	426	522
	1904	59,794	24,438,684	409	502
	1899	51,735	18,454,000	357	437
Tennessee	1925	107,645	95,255,480	885	----
	1923	106,504	92,481,539	868	1,033
	1921	75,446	65,741,000	871	1,038
	1919	95,167	81,355,256	855	1,020
	1914	74,373	33,082,987	445	530
	1909	73,840	28,251,591	383	458
	1904	60,572	22,805,628	377	449
	1899	45,963	14,727,000	320	382
Alabama	1925	116,599	101,242,839	868	----
	1923	109,620	95,205,227	869	1,131
	1921	82,748	66,747,000	807	1,049
	1919	107,159	99,065,800	924	1,205
	1914	78,717	33,896,871	431	559
	1909	72,148	27,284,266	378	490
	1904	62,173	21,878,451	352	458
	1899	52,711	14,912,000	283	366
Mississippi	1925	55,171	41,231,045	747	----
	1923	54,352	40,018,853	736	895
	1921	42,222	30,197,000	715	867
	1919	57,560	51,255,716	890	1,081
	1914	46,702	19,176,627	411	499
	1909	50,384	18,767,723	372	452
	1904	38,690	14,819,034	383	466
	1899	26,799	7,910,000	295	359
WEST SOUTH CENTRAL					
Arkansas	1925	43,977	37,538,492	854	----
	1923	44,545	37,770,294	848	919
	1921	33,431	27,804,000	832	899
	1919	49,954	47,186,189	945	1,023
	1914	41,979	20,751,731	494	533
	1909	44,982	19,112,896	425	462
	1904	33,089	14,543,635	440	476
	1899	31,525	10,184,000	323	347
Louisiana	1925	88,058	79,762,794	906	----
	1923	94,719	83,030,577	877	1,064
	1921	85,170	76,761,000	901	1,091
	1919	98,265	94,405,732	961	1,162
	1914	77,665	39,544,460	509	614
	1909	76,165	33,385,904	438	532
	1904	55,859	25,315,750	453	548
	1899	40,878	14,725,000	360	433
Oklahoma	1925	26,333	34,210,630	1,299	----
	1923	25,489	33,068,705	1,297	1,560
	1921	22,241	29,532,000	1,328	1,597
	1919	29,503	35,025,942	1,187	1,424
	1914	17,443	11,011,043	631	758
	1909	13,143	7,240,177	551	660
	1904	5,456	2,799,402	513	617
	1899	2,381	894,000	375	450
Texas	1925	106,792	116,363,302	1,090	----
	1923	102,358	111,461,949	1,089	1,241
	1921	88,707	103,946,000	1,172	1,338
	1919	107,522	116,403,800	1,083	1,235
	1914	74,853	44,821,377	599	683
	1909	70,230	37,907,272	540	615
	1904	49,066	24,468,942	499	569
	1899	38,604	16,912,000	438	501

TABLE C.—AVERAGE NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED FULL-TIME PER CAPITA EARNINGS, BY GEOGRAPHIC DIVISIONS AND STATES: 1899 TO 1925—Continued

DIVISION AND STATE	Census year	Average number of wage earners	Wages	Census average wage	Estimated full-time per capita earnings (male)
MOUNTAIN					
Montana	1925	14,777	$21,078,039	$1,426	
	1923	15,943	24,540,317	1,539	$1,723
	1921	11,384	16,791,000	1,475	1,658
	1919	17,160	24,742,562	1,442	1,615
	1914	13,704	13,001,205	949	1,062
	1909	11,655	10,901,452	935	1,051
	1904	8,957	8,652,217	966	1,084
	1899	9,854	7,377,000	749	846
Idaho	1925	15,794	20,708,725	1,311	
	1923	16,347	22,886,215	1,400	1,835
	1921	10,783	15,183,000	1,408	1,844
	1919	13,917	18,548,272	1,333	1,747
	1914	8,919	7,490,521	840	1,103
	1909	8,220	5,497,647	669	874
	1904	3,061	2,059,391	673	882
	1899	1,552	818,000	527	688
Wyoming	1925	6,333	10,526,253	1,662	
	1923	7,510	12,501,584	1,665	2,271
	1921	7,254	13,890,000	1,915	2,609
	1919	6,634	11,188,979	1,687	2,299
	1914	2,989	2,311,754	773	1,051
	1909	2,867	2,080,763	726	995
	1904	1,834	1,261,122	688	938
	1899	2,060	1,209,000	587	778
Colorado	1925	31,967	43,007,674	1,345	
	1923	31,226	40,652,745	1,302	1,584
	1921	27,625	38,612,000	1,398	1,702
	1919	35,254	42,974,879	1,219	1,483
	1914	27,278	20,199,754	741	902
	1909	28,067	19,912,342	709	859
	1904	21,813	15,100,365	692	843
	1899	19,498	11,708,000	600	733
New Mexico	1925	4,629	5,083,211	1,098	
	1923	5,459	6,483,635	1,188	1,393
	1921	4,477	4,880,000	1,090	1,277
	1919	5,736	6,658,462	1,161	1,364
	1914	3,776	2,695,448	714	834
	1909	4,143	2,591,379	625	733
	1904	3,478	2,153,068	619	726
	1899	2,490	1,199,000	482	566
Arizona	1925	9,127	11,506,159	1,261	
	1923	9,008	12,635,070	1,403	1,626
	1921	4,774	6,809,000	1,426	1,655
	1919	5,828	12,014,769	2,062	2,396
	1914	6,898	6,228,873	903	1,049
	1909	6,441	5,505,183	855	991
	1904	4,793	3,969,248	828	962
	1899	3,126	2,287,000	732	847
Utah	1925	15,077	18,199,536	1,207	
	1923	15,901	19,783,915	1,244	1,379
	1921	13,310	18,392,000	1,382	1,536
	1919	18,868	21,454,997	1,137	1,258
	1914	13,894	10,852,332	781	868
	1909	11,785	8,399,634	713	789
	1904	8,052	5,157,400	641	711
	1899	5,413	2,763,000	510	569
Nevada	1925	2,670	4,473,555	1,675	
	1923	4,666	7,795,029	1,671	2,043
	1921	2,393	4,020,000	1,680	2,053
	1919	3,119	4,318,022	1,384	1,693
	1914	3,655	3,577,936	979	1,196
	1909	2,257	1,981,762	878	1,080
	1904	802	693,407	865	1,058
	1899	504	353,000	700	857

TABLE C.—AVERAGE NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, CENSUS AVERAGE WAGE, AND ESTIMATED FULL-TIME PER CAPITA EARNINGS, BY GEOGRAPHIC DIVISIONS AND STATES: 1899 TO 1925—Continued

DIVISION AND STATE	Census year	Average number of wage earners	Wages	Census average wage	Estimated full-time per capita earnings (male)
PACIFIC					
Washington	1925	105,893	$146,224,608	$1,381	
	1923	111,663	156,434,842	1,401	$1,732
	1921	77,518	99,191,000	1,280	1,584
	1919	132,928	194,968,222	1,467	1,814
	1914	67,205	51,703,052	769	949
	1909	69,120	49,766,368	720	890
	1904	45,199	30,087,287	666	825
	1899	31,523	17,065,000	541	668
Oregon	1925	59,579	78,208,774	1,313	
	1923	62,655	81,768,700	1,305	1,582
	1921	40,167	49,395,000	1,230	1,492
	1919	58,559	81,093,784	1,385	1,679
	1914	28,829	20,931,577	726	877
	1909	28,750	19,901,934	692	839
	1904	18,523	11,443,512	618	750
	1899	14,459	6,822,000	472	570
California	1925	249,552	350,835,411	1,406	
	1923	246,154	353,183,303	1,435	1,751
	1921	198,334	284,373,000	1,434	1,760
	1919	243,692	305,207,389	1,252	1,531
	1914	139,481	105,612,681	757	931
	1909	115,296	84,141,477	730	891
	1904	100,355	64,656,686	644	789
	1899	77,224	39,890,000	517	631

TABLE D.—AVERAGE NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, AND CENSUS AVERAGE WAGE, BY SELECTED CITIES: 1899–1925

CITY	Census year	Average number of wage earners	Wages	Census average wage
Baltimore	1925	85,797	$93,612,030	$1,091
	1923	90,232	93,697,682	1,038
	1921	76,442	79,279,544	1,037
	1919	97,814	103,129,096	1,054
	1914	73,769	35,509,234	481
	1909	71,444	31,170,787	436
	1904	65,050	25,507,000	392
	1899	66,571	23,493,000	353
Boston [1]	1925	77,334	103,812,101	1,342
	1923	82,978	107,874,976	1,300
	1921	70,493	86,181,157	1,222
	1919	88,759	96,401,002	1,086
	1914	78,894	49,444,277	627
	1909	73,957	42,386,000	573
	1904	63,151	33,893,000	537
	1899	55,336	29,331,000	530
Buffalo	1925	66,015	95,999,930	1,454
	1923	70,092	96,573,062	1,378
	1921	54,565	70,366,446	1,290
	1919	75,899	95,702,219	1,261
	1914	54,416	34,817,852	640
	1909	51,412	28,727,228	559
	1904	43,567	21,621,762	496
	1899	34,275	15,678,000	457

[1] Does not include Hyde Park in 1909, 1904, and 1899. Hyde Park was annexed to Boston Jan. 1, 1912.

TABLE D.—AVERAGE NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, AND CENSUS AVERAGE WAGE, BY SELECTED CITIES: 1899–1925—Continued

CITY	Census year	Average number of wage earners	Wages	Census average wage
Chicago	1925	370,041	$563,634,650	$1,523
	1923	385,685	571,724,743	1,482
	1921	311,215	444,053,737	1,427
	1919	403,942	507,753,924	1,257
	1914	313,710	213,737,372	681
	1909	293,977	174,112,069	592
	1904	241,984	136,404,696	564
	1899	221,191	108,727,000	492
Cincinnati	1925	63,715	80,996,027	1,271
	1923	65,695	78,759,841	1,199
	1921	57,263	66,546,014	1,162
	1919	69,680	68,650,321	985
	1914	59,861	33,159,083	554
	1909	60,182	31,097,000	517
	1904	58,584	27,389,569	468
	1899	54,942	23,104,000	421
Cleveland	1925	132,852	201,377,925	1,516
	1923	141,648	205,387,834	1,450
	1921	103,396	133,033,607	1,287
	1919	157,730	211,206,276	1,339
	1914	103,317	67,350,779	652
	1909	84,728	48,052,971	567
	1904	64,041	33,450,000	522
	1899	55,341	26,518,000	479
Detroit	1925	172,742	293,896,362	1,701
	1923	171,025	282,741,469	1,653
	1921	95,376	150,619,761	1,579
	1919	167,016	245,433,882	1,470
	1914	99,603	69,446,759	697
	1909	81,011	43,006,902	531
	1904	48,483	22,558,000	465
	1899	38,373	15,317,000	399
Los Angeles	1925	58,026	85,735,570	1,478
	1923	55,467	81,468,129	1,469
	1921	42,161	58,495,564	1,387
	1919	47,118	55,110,578	1,170
	1914	23,744	18,277,077	770
	1909	17,327	12,587,617	726
	1904	10,424	7,088,175	680
	1899	5,173	2,600,000	503
Minneapolis	1925	31,730	40,310,728	1,270
	1923	33,462	41,162,971	1,230
	1921	28,810	36,157,240	1,255
	1919	38,154	41,274,916	1,082
	1914	28,295	18,894,649	668
	1909	26,962	15,638,114	580
	1904	21,671	11,418,000	527
	1899	19,620	9,383,000	478
New York	1925	538,845	844,648,136	1,568
	1923	579,005	851,186,143	1,470
	1921	536,654	762,596,719	1,421
	1919	638,775	805,822,451	1,262
	1914	585,279	357,497,611	611
	1909	553,923	323,414,000	584
	1904	464,716	248,128,259	534
	1899	388,586	196,656,000	506
Oakland	1925	15,537	21,654,451	1,394
	1923	15,027	21,096,479	1,404
	1921	16,187	23,089,973	1,426
	1919	23,347	31,579,253	1,353
	1914	7,706	5,965,861	774
	1909	6,905	5,317,241	770
	1904	3,353	2,068,000	617
	1899	2,476	1,210,000	489

TABLE D.—AVERAGE NUMBER OF WAGE EARNERS, AMOUNT PAID IN WAGES, AND CENSUS AVERAGE WAGE, BY SELECTED CITIES: 1899–1925—Continued

CITY	Census year	Average number of wage earners	Wages	Census average wage
Philadelphia	1925	246,680	$332,414,915	$1,348
	1923	274,319	356,437,915	1,299
	1921	226,042	270,267,014	1,197
	1919	281,105	326,792,395	1,163
	1914	251,286	138,249,444	550
	1909	251,294	126,049,000	502
	1904	228,899	107,640,307	470
	1899	214,775	94,737,000	441
Pittsburgh	1925	65,414	94,458,442	1,444
	1923	76,665	110,465,548	1,441
	1921	57,301	74,285,876	1,296
	1919	83,290	109,859,218	1,319
	1914	69,620	45,068,232	647
	1909	67,420	39,939,000	592
	1904	71,618	39,805,000	556
	1899	71,794	37,635,000	524
San Francisco	1925	41,373	60,525,243	1,463
	1923	43,638	61,376,028	1,406
	1921	36,903	53,584,895	1,452
	1919	48,550	59,704,342	1,230
	1914	31,758	25,288,625	796
	1909	28,244	22,381,452	792
	1904	38,429	25,015,427	651
	1899	32,555	17,259,000	530
St. Louis	1925	105,022	130,856,964	1,246
	1923	113,253	135,468,356	1,196
	1921	88,619	104,135,242	1,175
	1919	107,919	108,557,326	1,006
	1914	85,058	51,149,781	601
	1909	87,371	48,534,989	556
	1904	82,606	42,642,358	516
	1899	64,832	29,145,000	450
St. Paul	1925	23,664	30,701,146	1,297
	1923	22,841	29,108,015	1,274
	1921	18,059	24,291,030	1,345
	1919	22,649	24,449,322	1,079
	1914	19,483	12,795,651	657
	1909	19,339	10,951,605	566
	1904	14,363	7,210,757	502
	1899	13,019	5,324,000	409
Seattle	1925	19,220	27,610,151	1,437
	1923	17,842	25,322,656	1,419
	1921	13,699	19,142,388	1,397
	1919	40,843	63,394,584	1,552
	1914	12,429	9,934,922	799
	1909	11,523	8,568,818	745
	1904	6,390	4,318,080	676
	1899	4,440	2,681,609	604
New Orleans	1925	22,118	20,291,490	917
	1923	21,575	18,736,524	868
	1921	20,288	19,411,804	957
	1919	26,641	24,613,826	931
	1914	17,348	8,537,796	492
	1909	17,186	8,020,060	467
	1904	17,468	7,396,000	423
	1899	16,185	6,176,279	382

TABLE E.—CENSUS AVERAGE WAGE AND ESTIMATED FULL-TIME YEARLY EARNINGS FOR MALE AND FEMALE WAGE EARNERS IN 2 LEADING STATES FOR EACH OF THE 24 INDUSTRIES, CENSUS YEARS: 1899–1921

SELECTED INDUSTRY, STATE, AND CENSUS YEAR	Census average wage	ESTIMATED FULL-TIME ANNUAL EARNINGS PER CAPITA	
		Men	Women
Tobacco, cigars and cigarettes:			
Florida—			
1921	$957	$1,140	$583
1919	958	1,140	583
1914	617	735	376
1909	584	694	355
1904	578	687	351
1899	498	591	302
Pennsylvania—			
1921	716	920	559
1919	730	937	570
1914	359	462	281
1909	350	449	273
1904	339	436	265
1899	336	431	263
Clothing, men's:			
New York—			
1921	1,443	2,172	1,107
1919	1,368	2,055	1,048
1914	540	813	415
1909	526	792	403
1904	483	726	370
1899	474	712	363
Illinois—			
1921	1,533	2,494	1,219
1919	1,337	2,180	1,065
1914	573	936	457
1909	462	755	369
1904	483	787	385
1899	390	638	312
Clothing, women's:			
New York—			
1921	1,465	2,283	1,339
1919	1,341	2,089	1,225
1914	592	921	540
1909	559	869	509
1904	481	749	439
1899	451	704	413
Illinois—			
1921	1,186	2,481	1,061
1919	1,118	2,334	998
1914	558	1,167	499
1909	512	1,069	457
1904	469	981	419
1899	339	706	302
Cotton manufactures:			
Massachusetts—			
1921	908	1,235	983
1919	897	1,219	971
1914	447	605	481
1909	414	560	446
1904	368	500	398
1899	351	475	378
North Carolina—			
1921	624	1,077	780
1919	730	1,258	912
1914	294	508	368
1909	257	444	322
1904	206	355	258
1899	169	292	211
Knit goods:			
Pennsylvania—			
1921	833	1,519	922
1919	696	1,271	772
1914	374	682	414
1909	308	563	342
1904	283	517	314
1899	270	491	298
Knit goods—Continued.			
New York—			
1921	$355	$1,377	$1,076
1919	821	1,187	927
1914	444	641	501
1909	412	596	466
1904	347	501	391
1899	339	491	384
Shirts:			
New York—			
1921	907	1,561	949
1919	788	1,360	827
1914	401	692	421
1909	394	680	414
1904	343	591	360
1899	346	597	363
Pennsylvania—			
1921	563	1,534	576
1919	493	1,345	505
1914	314	854	320
1909	298	816	306
1904	277	756	284
1899	250	680	255
Silk goods, including throwsters:			
Pennsylvania—			
1921	827	1,674	1,035
1919	719	1,459	902
1914	364	740	457
1909	314	635	393
1904	259	525	324
1899	220	446	276
New Jersey—			
1921	1,077	1,774	1,211
1919	1,016	1,672	1,141
1914	524	861	588
1909	460	759	518
1904	388	638	436
1899	382	625	427
Woolen goods:			
Massachusetts—			
1921	1,193	1,395	1,035
1919	1,127	1,319	978
1914	520	606	450
1909	466	546	405
1904	432	505	375
1899	385	450	334
Pennsylvania—			
1921	1,078	1,470	984
1919	1,118	1,526	1,021
1914	476	649	434
1909	428	583	390
1904	372	507	339
1899	371	507	339
Worsted goods:			
Massachusetts—			
1921	1,087	1,502	995
1919	1,018	1,404	930
1914	499	689	456
1909	452	623	413
1904	393	542	359
1899	374	515	341
Pennsylvania—			
1921	1,011	1,604	989
1919	1,011	1,604	989
1914	440	696	429
1909	387	611	377
1904	354	561	346
1899	327	516	318

TABLE E.—CENSUS AVERAGE WAGE AND ESTIMATED FULL-TIME YEARLY EARNINGS FOR MALE AND FEMALE WAGE EARNERS IN 2 LEADING STATES FOR EACH OF THE 24 INDUSTRIES, CENSUS YEARS: 1899–1921—Continued

SELECTED INDUSTRY, STATE, AND CENSUS YEAR	Census average wage	ESTIMATED FULL-TIME ANNUAL EARNINGS PER CAPITA	
		Men	Women
Boots and shoes:			
Massachusetts—			
1921	$1,185	$1,679	$1,120
1919	1,116	1,582	1,056
1914	608	862	575
1909	562	795	530
1904	529	750	500
1899	473	667	445
Missouri—			
1921	956	1,623	1,066
1919	790	1,341	881
1914	464	791	519
1909	470	798	524
1904	416	706	464
1899	347	586	385
Leather, tanned, curried, and finished:			
Massachusetts—			
1921	1,260	1,420	-------
1919	1,266	1,425	-------
1914	582	656	-------
1909	531	600	-------
1904	502	566	-------
1899	482	543	-------
Pennsylvania—			
1921	1,182	1,443	-------
1919	1,255	1,530	-------
1914	542	662	-------
1909	486	592	-------
1904	445	543	-------
1899	407	494	-------
Furniture:			
New York—			
1921	1,336	1,724	-------
1919	1,140	1,474	-------
1914	619	798	-------
1909	573	737	-------
1904	524	676	-------
1899	482	622	-------
Michigan—			
1921	1,261	1,763	-------
1919	1,063	1,487	-------
1914	582	815	-------
1909	502	708	-------
1904	448	627	-------
1899	385	540	-------
Lumberand timber products:			
Washington—			
1921	1,208	1,457	-------
1919	1,507	1,817	-------
1914	771	928	-------
1909	717	864	-------
1904	664	800	-------
1899	542	656	-------
Louisiana—			
1921	781	963	-------
1919	1,114	1,246	-------
1914	537	663	-------
1909	433	532	-------
1904	460	567	-------
1899	328	402	-------
Lumber, planing-mill products, not including planing mills connected with sawmills:			
New York—			
1921	1,448	1,882	-------
1919	1,165	1,519	-------
1914	665	865	-------
1909	606	792	-------
1904	558	727	-------
1899	485	632	-------
Lumber, etc.—Contd.			
California—			
1921	$1,474	$1,719	-------
1919	1,277	1,491	-------
1914	891	1,035	-------
1909	855	1,000	-------
1904	753	877	-------
1899	599	702	-------
Paper and wood pulp:			
New York—			
1921	1,343	1,286	-------
1919	1,258	1,201	-------
1914	632	659	-------
1909	559	576	-------
1904	516	583	-------
1899	442	456	-------
Maine—			
1921	1,394	1,540	-------
1919	1,264	1,368	-------
1914	673	744	-------
1909	609	673	-------
1904	535	590	-------
1899	446	490	-------
Printing and publishing, newspapers and periodicals:			
New York—			
1921	1,816	2,202	$979
1919	1,330	1,607	704
1914	918	1,111	494
1909	820	991	441
1904	758	918	408
1899	664	808	359
Illinois—			
1921	1,699	1,930	806
1919	1,177	1,279	535
1914	744	848	355
1909	669	764	320
1904	665	757	317
1899	495	560	235
Printing and publishing, book and job:			
New York—			
1921	1,688	2,112	1,151
1919	1,312	1,643	896
1914	734	916	499
1909	658	826	450
1904	605	757	413
1899	569	712	388
Illinois—			
1921	1,554	2,177	997
1919	1,265	1,771	810
1914	742	1,040	476
1909	634	885	405
1904	579	812	372
1899	482	674	309
Glass:			
Pennsylvania—			
1921	1,218	1,682	654
1919	1,225	1,691	657
1914	645	891	346
1909	567	783	304
1904	602	833	324
1899	530	733	285
West Virginia—			
1921	1,332	2,165	491
1919	1,170	1,902	430
1914	638	1,037	235
1909	586	955	216
1904	559	910	206
1899	405	655	148

TABLE E.—CENSUS AVERAGE WAGE AND ESTIMATED FULL-TIME YEARLY EARNINGS FOR MALE AND FEMALE WAGE EARNERS IN 2 LEADING STATES FOR EACH OF THE 24 INDUSTRIES, CENSUS YEARS: 1899–1921—Continued

SELECTED INDUSTRY, STATE, AND CENSUS YEAR	Census average wage	ESTIMATED FULL-TIME ANNUAL EARNINGS PER CAPITA	
		Men	Women
Iron and steel, blast furnaces:			
Pennsylvania—			
1921	$1,681	$2,066	-------
1919	1,869	2,300	-------
1914	811	999	-------
1909	651	799	-------
1904	560	689	-------
1899	500	613	-------
Alabama—			
1921	1,286	1,765	-------
1919	1,377	1,889	-------
1914	560	767	-------
1909	549	751	-------
1904	391	537	-------
1899	275	375	-------
Iron and steel, steel works and rolling mills:			
Pennsylvania—			
1921	1,349	1,624	-------
1919	1,740	2,093	-------
1914	735	887	-------
1909	671	809	-------
1904	589	709	-------
1899	569	688	-------
Ohio—			
1921	1,450	1,777	-------
1919	1,880	2,303	-------
1914	819	1,004	-------
1909	742	905	-------
1904	672	823	-------
1899	595	732	-------
Foundry and machine-shop products:			
Ohio—			
1921	1,274	1,816	-------
1919	1,319	1,877	-------
1914	664	950	-------
1909	597	850	-------
1904	542	773	-------
1899	492	703	-------
New York—			
1921	1,292	1,841	-------
1919	1,280	1,825	-------
1914	700	999	-------
1909	638	908	-------
1904	579	826	-------
1899	550	784	-------
Agricultural implements:			
Illinois—			
1921	$1,401	$1,734	-------
1919	1,257	1,556	-------
1914	801	992	-------
1909	609	756	-------
1904	576	713	-------
1899	497	614	-------
Indiana—			
1921	1,172	1,497	-------
1919	1,338	1,711	-------
1914	640	819	-------
1909	540	692	-------
1904	520	666	-------
1899	466	599	-------
Electrical machinery, apparatus, and supplies:			
New York—			
1921	1,219	1,360	$678
1919	1,216	1,354	675
1914	682	762	380
1909	658	731	364
1904	570	635	317
1899	546	610	304
Illinois—			
1921	1,460	1,985	1,065
1919	1,120	1,524	818
1914	750	1,021	548
1909	665	900	483
1904	522	709	380
1899	466	631	339
Chemicals:			
New Jersey—			
1921	1,270	1,520	-------
1919	1,195	1,428	-------
1914	657	788	-------
1909	574	683	-------
1904	515	616	-------
1899	517	616	-------
New York—			
1921	1,249	1,423	-------
1919	1,357	1,546	-------
1914	691	785	-------
1909	587	669	-------
1904	539	614	-------
1899	508	577	-------

TABLE F.—CHANGES IN THE QUALITY OF LABOR IN DIFFERENT INDUSTRIES[1]

INDUSTRY GROUP, INDUSTRY, AND TYPE OF LABOR	PROPORTIONS OF TOTAL EMPLOYED IN THE INDUSTRY	
	1910	1920
Bread and other bakery products:		
Unskilled	5	6
Semiskilled	9	14
Skilled	89	69
Flour-mill and gristmill products:		
Unskilled	23	40
Semiskilled	10	18
Skilled	59	51
Confectionery:[2]		
Unskilled	7	7
Semiskilled	69	55
Skilled		
Slaughtering and meat packing:		
Unskilled	38	37
Semiskilled	29	30
Skilled		
Liquors, malt:		
Unskilled[3]	24	19
Semiskilled[3]	40	28
Skilled	53	52
Tobacco manufactures:		
Unskilled	10	22
Semiskilled		
Skilled		
Carpets and rugs, other than rag:		
Unskilled	11	17
Semiskilled		
Skilled	40	70
Shirts:		
Unskilled	5	7
Semiskilled		
Skilled		
Clothing, men's:		
Unskilled	2	2
Semiskilled	72	82
Skilled		
Clothing, women's:		
Unskilled		
Semiskilled	90	87
Skilled		
Dyeing and finishing textiles, exclusive of that done in textile mills:		
Unskilled	23	19
Semiskilled	37	32
Skilled	32	27
Knit goods:		
Unskilled	6	7
Semiskilled	68	62
Skilled		
Silk goods, including throwsters:		
Unskilled	4	8
Semiskilled	80	91
Skilled		
Woolen and worsted goods:		
Unskilled	7	13
Semiskilled	65	76
Skilled		
Boots and shoes, not including rubber boots and shoes:		
Unskilled	5	9
Semiskilled	91	98
Skilled		
Leather, tanned, curried, and finished:		
Unskilled	33	27
Semiskilled	54	44
Skilled		
Furniture:		
Unskilled	18	25
Semiskilled	35	40
Skilled		
Lumber, planing-mill products, not including planing mills connected with sawmills:		
Unskilled	59	66
Semiskilled		
Skilled		
Petroleum refining:		
Unskilled	81	54
Semiskilled	12	15
Skilled		
Glass:		
Unskilled	36	37
Semiskilled	61	58
Skilled	23	12
Foundry and machine-shop products:		
Unskilled	26	37
Semiskilled	29	51
Skilled		
Automobiles:		
Unskilled	31	40
Semiskilled	41	58
Skilled		
Railroad repair shops—steam:		
Unskilled	17	11
Semiskilled	17	20
Skilled		
Agricultural implements:		
Unskilled	22	21
Semiskilled	10	14
Skilled		
Shipbuilding, steel:		
Unskilled	43	20
Semiskilled	52	28
Skilled		
Electrical machinery, apparatus, and supplies:		
Unskilled	13	13
Semiskilled	28	31
Skilled		
Paper and wood pulp:		
Unskilled	41	46
Semiskilled	48	48
Skilled		
Printing and publishing, book and job:		
Unskilled	3	9
Semiskilled	27	65
Skilled		
Printing and publishing, newspapers and periodicals:		
Unskilled		
Semiskilled		
Skilled		
Smelting and refining, copper, lead, and zinc:		
Unskilled	66	53
Semiskilled	13	15
Skilled		

[1] The totals on the basis of which these percentages were calculated are from the manufactures census.
[2] Figures are for "confectionery and ice cream."
[3] Figures are for "liquors and beverages."

TABLE G.—PROPORTIONS OF WOMEN AND CHILDREN IN THE SELECTED INDUSTRIES: 1899–1919

INDUSTRY	PROPORTION OF WHOLE NUMBER OF WAGE EARNERS IN THE SPECIFIED INDUSTRY				
	1899	1904	1909	1914	1919
All industries:					
Women	20	20	20	20	20
Children	3	3	2	2	1
Bread and other bakery products:					
Women	17	18	17	20	26
Children	3	2	2	1	1
Confectionery and ice cream:					
Women	54	58	58	52	53
Children	6	5	6	4	4
Flour-mill and gristmill products:					
Women	1	1	1	1	2
Children	(1)	(1)	(1)	----	---
Slaughtering and meat packing, wholesale:					
Women	4	6	6	7	10
Children	2	1	1	----	---
Liquors, malt:					
Women	1	1	2	1	1
Children	2	1	----	----	---
Mineral and soda waters:					
Women	3	2	2	----	4
Children	3	3	3	----	2
Tobacco, cigars and cigarettes:					
Women	37	42	47	54	58
Children	5	5	4	2	1
Carpets and rugs, other than rag:					
Women	44	43	40	40	36
Children	7	6	4	2	3
Clothing, men's:					
Women	63	60	56	51	53
Children	2	2	2	1	1
Clothing, women's:					
Women	68	62	63	63	66
Children	1	1	1	1	1
Dyeing and finishing textiles, exclusive of that done in textile mills:					
Women	14	16	18	18	23
Children	4	4	2	2	2
Knit goods:					
Women	64	67	65	66	67
Children	10	9	8	6	5
Shirts:					
Women	----	----	----	77	81
Children	----	----	----	3	3
Silk goods, including throwsters:					
Women	53	57	57	54	57
Children	10	9	8	7	5
Woolen goods:					
Women	----	----	----	32	32
Children	----	----	----	2	2
Worsted goods:					
Women	----	----	----	47	47
Children	----	----	----	5	6
Boots and shoes, not including rubber boots and shoes:					
Women	33	33	33	35	37
Children	3	3	4	2	3
Leather, tanned, curried, and finished:					
Women	2	3	3	3	8
Children	1	2	1	----	1
Furniture:					
Women	3	3	3	3	8
Children	3	3	2	1	1
Lumber and timber products:					
Women	1	1	1	----	1
Children	1	1	1	----	---
Lumber, planing-mill products, not including planing mills connected with sawmills:					
Women	----	----	----	1	2
Children	----	----	----	1	1
Paper and wood pulp:					
Women	16	14	13	11	9
Children	----	----	----	----	---
Printing and publishing, book and job:					
Women	20	23	22	22	25
Children	5	3	2	2	2
Printing and publishing, newspapers and periodicals:					
Women	----	----	----	15	17
Children	----	----	----	3	4
Chemicals:					
Women	5	6	4	5	8
Children	----	----	1	1	---
Petroleum refining:					
Women	1	1	1	1	2
Children	2	3	----	----	---
Glass:					
Women	7	5	5	6	11
Children	14	10	5	3	2
Foundry and machine-shop products:					
Women	1	2	2	2	3
Children	1	1	1	----	---
Iron and steel, blast furnaces:					
Women	(1)	(1)	(1)	(1)	(1)
Children	(1)	(1)	(1)	(1)	(1)
Iron and steel, steel works and rolling mills:					
Women	1	1	----	----	1
Children	1	1	1	----	---
Smelting and refining, copper, lead, and zinc:					
Women	----	----	----	----	---
Children	----	----	----	----	---
Automobile bodies and parts:					
Women	----	----	----	2	5
Children	----	----	----	----	---
Automobiles:					
Women	----	----	1	2	3
Children	----	1	----	----	---
Cars, steam-railroad, not including operations of railroad companies:					
Women	----	----	----	----	1
Children	1	----	----	----	---
Railroad repair shops—electric:					
Women	----	----	----	----	1
Children	----	----	----	----	---
Railroad repair shops—steam:					
Women	----	----	----	----	---
Children	----	----	----	----	---
Agricultural implements:					
Women	1	1	1	1	2
Children	----	----	----	----	---
Electrical machinery, apparatus, and supplies:					
Women	17	18	23	20	26
Children	----	----	----	1	1

(1) Less than one-half of 1 per cent.

TABLE G.—PROPORTIONS OF WOMEN AND CHILDREN IN THE SELECTED INDUSTRIES: 1899–1919—Continued

INDUSTRY	PROPORTION OF WHOLE NUMBER OF WAGE EARNERS IN THE SPECIFIED INDUSTRY					INDUSTRY	PROPORTION OF WHOLE NUMBER OF WAGE EARNERS IN THE SPECIFIED INDUSTRY				
	1899	1904	1909	1914	1919		1899	1904	1909	1914	1919
Shipbuilding, steel:						Brick and tile, terra-cotta, and fire-clay products:					
Women						Women	(1)	(1)	(1)	1	2
Children	2	2	1	1		Children	3	2	2	1	1
Rubber goods:						Pottery:					
Women	36	33	16	13	12	Women	10	11	11	23	25
Children	3	2	1	1	1	Children	2	2	2	1	1

[1] Less than one-half of 1 per cent.

TABLE H.—WAGE EARNERS DISTRIBUTED ACCORDING TO THE PER CAPITA MONEY EARNINGS ESTIMATED TO HAVE BEEN RECEIVED IN 1919 IN THE ESTABLISHMENT IN WHICH THEY WERE EMPLOYED, BY INDUSTRIES [1]

CLASS OF EARNINGS	Number of establishments	WAGE EARNERS			CLASS OF EARNINGS	Number of establishments	WAGE EARNERS		
		Number	Per cent in each group	Cumulative per cent			Number	Per cent in each group	Cumulative per cent
AUTOMOBILES (Weighted average, $1,456)									
Total	59	46,826	100.0		$1,300–$1,399	12	8,569	18.3	92.8
					$1,400–$1,499	12	20,322	43.4	74.5
$600–$699	3	187	0.4	100.0	$1,500–$1,599	6	12,690	27.1	31.1
$700–$799				99.6	$1,600–$1,699	2	1,171	2.5	4.0
$800–$899	3	843	1.8	99.6	$1,700–$1,799	2	375	.8	1.5
$900–$999	2			97.8	$1,900–$1,999	1	187	.4	.7
$1,000–$1,099	5	656	1.4	97.8	$2,000–$2,099	1	140	.3	.3
$1,100–$1,199	5	609	1.3	96.4	$2,200–$2,299	1			
$1,200–$1,299	4	1,077	2.3	95.1					
BOOTS AND SHOES (Weighted average, $1,016)									
Total	291	29,362	100.0		$1,300–$1,399	16	2,202	7.5	17.3
					$1,400–$1,499	14	587	2.0	9.8
Less than $300	4	88	0.3	100.0	$1,500–$1,599	10	294	1.0	7.8
$300–$399	4	29	.1	99.7	$1,600–$1,699	18	734	2.5	6.8
$400–$499	8	59	.2	99.6	$1,700–$1,799	11	617	2.1	4.3
$500–$599	17	352	1.2	99.4	$1,800–$1,899	5	88	.3	2.2
$600–$699	8	1,468	5.0	98.2	$1,900–$1,999	4	147	.5	1.9
$700–$799	14	5,520	18.8	93.2	$2,000–$2,099	5	176	.6	1.4
$800–$899	29	4,904	16.7	74.4	$2,100–$2,199	4	117	.4	.8
$900–$999	34	4,610	15.7	57.7	$2,200–$2,299	1	29	.1	.4
$1,000–$1,099	32	4,346	14.8	42.0	$2,300–$2,399	2	59	.2	.3
$1,100–$1,199	25	1,615	5.5	27.2	$2,400–$2,499	1			.1
$1,200–$1,299	23	1,292	4.4	21.7	$2,800–$2,899	1	29	.1	.1

See footnote at end of table, p. 402.

TABLE H.—WAGE EARNERS DISTRIBUTED ACCORDING TO THE PER CAPITA MONEY EARNINGS ESTIMATED TO HAVE BEEN RECEIVED IN 1919 IN THE ESTABLISHMENT IN WHICH THEY WERE EMPLOYED, BY INDUSTRIES [1]—Contd.

CLASS OF EARNINGS	Number of establishments	WAGE EARNERS			CLASS OF EARNINGS	Number of establishments	WAGE EARNERS		
		Number	Per cent in each group	Cumulative per cent			Number	Per cent in each group	Cumulative per cent
BRASS, BRONZE, AND COPPER PRODUCTS (Weighted average, $1,202)									
Total	269	16,982	100.0		$1,400–$1,499	20	849	5.0	26.9
					$1,500–$1,599	15	1,087	6.4	21.9
Less than $300	4	425	2.5	100.0	$1,600–$1,699	14	696	4.1	15.5
$300–$399	3			97.5	$1,700–$1,799	12	1,153	6.8	11.4
$400–$499	1			97.5	$1,800–$1,899	12	153	.9	4.6
$500–$599	3	17	.1	97.5	$1,900–$1,999	6	543	3.2	3.7
$600–$699	5	238	1.4	97.4	$2,000–$2,099	1			.5
$700–$799	8	2,666	15.7	96.0	$2,100–$2,199	1			.5
$800–$899	13	1,274	7.5	80.3	$2,200–$2,299	2	34	.2	.5
$900–$999	25	426	2.5	72.8	$2,300–$2,399	2			.3
$1,000–$1,099	26	1,172	6.9	70.3	$2,400–$2,499	1			.3
$1,100–$1,199	27	1,036	6.1	63.4	$2,500–$2,599	1	51	.3	.3
$1,200–$1,299	34	3,209	18.9	57.3	$2,600–$2,699	1			
$1,300–$1,399	32	1,953	11.5	38.4					
CARS AND GENERAL CONSTRUCTION AND REPAIRS, STEAM-RAILROAD REPAIR SHOPS (Weighted average, $1,392)									
Total	48	21,520	100.0		$1,500–$1,599	10	4,046	18.8	29.9
					$1,600–$1,699	8	1,634	7.6	11.1
$700–$799	2	2,174	10.1	100.0	$1,700–$1,799	2	194	.9	3.5
$1,100–$1,199	1	129	.6	89.9	$1,800–$1,899	1	43	.2	2.6
$1,200–$1,299	4	1,098	5.1	89.3	$1,900–$1,999	2	387	1.8	2.4
$1,300–$1,399	5	3,852	17.9	84.2	$2,000–$2,099	1	86	.4	.6
$1,400–$1,499	11	7,834	36.4	66.3	$2,400–$2,499	1	43	.2	.2
CLOTHING, WOMEN'S (Weighted average, $1,227)									
Total	5,340	109,251	100.0		$1,600–$1,699	190	3,923	3.6	21.6
					$1,700–$1,799	167	3,923	3.6	18.0
Less than $300	301	1,199	1.1	100.0	$1,800–$1,899	148	3,052	2.8	14.4
$300–$399	147	1,199	1.1	98.9	$1,900–$1,999	115	2,725	2.5	11.6
$400–$499	182	2,071	1.9	97.8	$2,000–$2,099	110	2,071	1.9	9.1
$500–$599	250	4,577	4.2	95.9	$2,100–$2,199	81	1,962	1.8	7.2
$600–$699	356	6,975	6.4	91.7	$2,200–$2,299	55	872	.8	5.4
$700–$799	381	8,719	8.0	85.3	$2,300–$2,399	49	1,308	1.2	4.6
$800–$899	409	9,264	8.5	77.3	$2,400–$2,499	45	872	.8	3.4
$900–$999	383	9,746	8.9	68.8	$2,500–$2,599	23	327	.3	2.6
$1,000–$1,099	363	8,937	8.2	60.1	$2,600–$2,699	21	872	.8	2.3
$1,100–$1,199	344	8,501	7.8	51.9	$2,700–$2,799	22	327	.3	1.5
$1,200–$1,299	319	6,430	5.9	44.1	$2,800–$2,899	16	327	.3	1.2
$1,300–$1,399	279	5,667	5.2	38.2	$2,900–$2,999	9	109	.1	.9
$1,400–$1,499	258	6,321	5.8	33.0	$3,000 and over	57	872	.8	.8
$1,500–$1,599	260	6,103	5.6	27.2					
FOUNDRY AND MACHINE-SHOP PRODUCTS (Weighted average, $1,322)									
Total	1,477	76,177	100.0		$1,600–$1,699	73	4,799	6.3	15.9
					$1,700–$1,799	62	3,809	5.0	9.6
Less than $300	18	152	.2	100.0	$1,800–$1,899	52	1,219	1.6	4.6
$300–$399	8			99.8	$1,900–$1,999	31	1,143	1.5	3.0
$400–$499	10	76	.1	99.8	$2,000–$2,099	21	381	.5	1.5
$500–$599	28	457	.6	99.7	$2,100–$2,199	13	76	.1	1.0
$600–$699	27	457	.6	99.1	$2,200–$2,299	9	229	.3	.9
$700–$799	53	533	.7	98.5	$2,300–$2,399	11	152	.2	.6
$800–$899	63	2,057	2.7	97.8	$2,400–$2,499	6	76	.1	.4
$900–$999	100	5,866	7.7	95.1	$2,500–$2,599	5			.3
$1,000–$1,099	122	7,923	10.4	87.4	$2,600–$2,699	5	76	.1	.3
$1,100–$1,199	149	7,389	9.7	77.0	$2,700–$2,799	4	76	.1	.2
$1,200–$1,299	189	15,007	19.7	67.3	$2,800–$2,899	1			.1
$1,300–$1,399	118	7,008	9.2	47.6	$2,900–$2,999	3			.1
$1,400–$1,499	149	9,827	12.9	38.4	$3,000 and over	9	76	.1	.1
$1,500–$1,599	138	7,313	9.6	25.5					

See footnote at end of table, p. 402.

TABLE H.—WAGE EARNERS DISTRIBUTED ACCORDING TO THE PER CAPITA MONEY EARNINGS ESTIMATED TO HAVE BEEN RECEIVED IN 1919 IN THE ESTABLISHMENTS IN WHICH THEY WERE EMPLOYED, BY INDUSTRIES [1]—Contd.

CLASS OF EARNINGS	Number of establishments	WAGE EARNERS			CLASS OF EARNINGS	Number of establishments	WAGE EARNERS		
		Number	Per cent in each group	Cumulative per cent			Number	Per cent in each group	Cumulative per cent
FURNITURE (Weighted average, $1,253)									
Total	663	14,258	100.0		$1,500–$1,599	46	1,169	8.2	21.3
					$1,600–$1,699	32	485	3.4	13.1
Less than $300	16	71	.5	100.0	$1,700–$1,799	23	428	3.0	9.7
$300–$399	10	86	.6	99.5	$1,800–$1,899	22	299	2.1	6.7
$400–$499	8	43	.3	98.9	$1,900–$1,999	11	114	.8	4.6
$500–$599	6	29	.2	98.6	$2,000–$2,099	16	171	1.2	3.8
$600–$699	22	299	2.1	98.4	$2,100–$2,199	11	128	.9	2.6
$700–$799	21	299	2.1	96.3	$2,200–$2,299	5	29	.2	1.7
$800–$899	32	1,554	10.9	94.2	$2,300–$2,399	7	43	.3	1.5
$900–$999	49	1,283	9.0	83.3	$2,400–$2,499	4	29	.2	1.2
$1,000–$1,099	49	1,668	11.7	74.3	$2,500–$2,599	4	29	.2	1.0
$1,100–$1,199	52	1,169	8.2	62.6	$2,600–$2,699	2			.8
$1,200–$1,299	105	1,896	13.3	54.4	$2,700–$2,799	3	14	.1	.8
$1,300–$1,399	54	1,640	11.5	41.1	$2,900–$2,999	2	43	.3	.7
$1,400–$1,499	40	1,183	8.3	29.6	$3,000 and over	11	57	.4	.4
IRON AND STEEL, STEEL WORKS AND ROLLING MILLS (Weighted average, $1,526)									
Total	54	38,313	100.0		$1,200–$1,299	5	1,034	2.7	82.9
					$1,300–$1,399	9	4,904	12.8	80.2
Less than $300	1	920	2.4	100.0	$1,400–$1,499	7	5,172	13.5	67.4
$500–$599	1	651	1.7	97.6	$1,500–$1,599	7	3,985	10.4	53.9
$700–$799	2	1,801	4.7	95.9	$1,600–$1,699	4	3,448	9.0	43.5
$800–$899	1	77	.2	91.2	$1,700–$1,799	3	1,839	4.8	34.5
$900–$999	2	536	1.4	91.0	$1,800–$1,899	3	3,065	8.0	29.7
$1,000–$1,099	3	766	2.0	89.6	$1,900–$1,999	2	460	1.2	21.7
$1,100–$1,199	2	1,801	4.7	87.6	$2,000–$2,099	2	7,854	20.5	20.5
MINERAL AND SODA WATERS (Weighted average, $1,160)									
Total	294	1,846	100.0		$1,300–$1,399	31	164	8.9	26.2
					$1,400–$1,499	14	137	7.4	17.3
Less than $300	9	9	.5	100.0	$1,500–$1,599	15	42	2.3	9.9
$300–$399	3	2	.1	99.5	$1,600–$1,699	4	9	.5	7.6
$400–$499	5	30	1.6	99.4	$1,700–$1,799	7	18	1.0	7.1
$500–$599	11	22	1.2	97.8	$1,800–$1,899	7	30	1.6	6.1
$600–$699	7	39	2.1	96.6	$1,900–$1,999	4	6	.3	4.5
$700–$799	17	90	4.9	94.5	$2,000–$2,099	4	11	.6	4.2
$800–$899	21	151	8.2	89.6	$2,100–$2,199	3	24	1.3	3.6
$900–$999	37	186	10.1	81.4	$2,200–$2,299	1	26	1.4	2.3
$1,000–$1,099	33	297	16.1	71.3	$2,300–$2,399	1	7	.4	.9
$1,100–$1,199	28	390	21.1	55.2	$2,400–$2,499	2	6	.3	.5
$1,200–$1,299	29	146	7.9	34.1	$2,500–$2,599	1	4	.2	.2
PRINTING AND PUBLISHING, NEWSPAPERS AND PERDIOICALS (Weighted average, $1,466)									
Total	447	25,531	100.0		$1,600–$1,699	23	945	3.7	27.9
					$1,700–$1,799	18	1,557	6.1	24.2
Less than $300	5	26	0.1	100.0	$1,800–$1,899	21	2,093	8.2	18.1
$300–$399	7	51	.2	99.9	$1,900–$1,999	18	1,353	5.3	9.9
$400–$499	4	26	.1	99.7	$2,000–$2,099	13	204	.8	4.6
$500–$599	10	102	.4	99.6	$2,100–$2,199	9	306	1.2	3.8
$600–$699	19	255	1.0	99.2	$2,200–$2,299	8	77	.3	2.6
$700–$799	25	1,021	4.0	98.2	$2,300–$2,399	4	51	.2	2.3
$800–$899	22	485	1.9	94.2	$2,400–$2,499	4	153	.6	2.1
$900–$999	30	689	2.7	92.3	$2,500–$2,599	2	77	.3	1.5
$1,000–$1,099	28	1,430	5.6	89.6	$2,600–$2,699	1	26	.1	1.2
$1,100–$1,199	30	945	3.7	84.0	$2,700–$2,799	2			1.1
$1,200–$1,299	28	1,481	5.8	80.3	$2,800–$2,899	2	51	.2	1.1
$1,300–$1,399	36	3,855	15.1	74.5	$2,900–$2,999	1			.9
$1,400–$1,499	31	5,208	20.4	59.4	$3,000 and over	5	230	.9	.9
$1,500–$1,599	41	2,834	11.1	39.0					

See footnote at end of table, p. 402.

TABLE H.—WAGE EARNERS DISTRIBUTED ACCORDING TO THE PER CAPITA MONEY EARNINGS ESTIMATED TO HAVE BEEN RECEIVED IN 1919 IN THE ESTABLISHMENES IN WHICH THEY WERE EMPLOYED, BY INDUSTRIES [1]—Contd.

CLASS OF EARNINGS	Number of establishments	WAGE EARNERS			CLASS OF EARNINGS	Number of establishments	WAGE EARNERS		
		Number	Per cent in each group	Cumulative per cent			Number	Per cent in each group	Cumulative per cent
SLAUGHTERING (Weighted average, $1,544)									
Total	74	1,284	100.0		$1,500–$1,599	7	366	28.5	57.8
					$1,600–$1,699	4	77	6.0	29.3
Less than $300	3	1	.1	100.0	$1,700–$1,799	4	104	8.1	23.3
$300–$399				99.9	$1,800–$1,899	3	26	2.0	15.2
$400–$499	1	1	.1	99.9	$1,900–$1,999	4	14	1.1	13.2
$500–$599	1			99.8	$2,000–$2,099	3	55	4.3	12.1
$700–$799	2	12	.9	99.8	$2,200–$2,299	1	12	.9	7.8
$800–$899	3	51	4.0	98.9	$2,300–$2,399	1	8	.6	6.9
$900–$999	2	6	.5	94.9	$2,400–$2,499				6.3
$1,000–$1,099	10	141	11.0	94.4	$2,500–$2,599	1	1	.1	6.3
$1,100–$1,199	6	87	6.8	83.4	$2,700–$2,799	1	55	4.3	6.2
$1,200–$1,299	4	67	5.2	76.6	$2,900–$2,999	1	13	1.0	1.9
$1,300–$1,399	7	77	6.0	71.4	$3,000 and over	1	12	.9	.9
$1,400–$1,499	4	98	7.6	65.4					
TOBACCO, CIGARS AND CIGARETTES (Weighted average, $758)									
Total	1,205	24,944	100.0		$1,000–$1,099	105	1,322	5.3	17.3
					$1,100–$1,199	79	923	3.7	12.0
Less than $300	64	499	2.0	100.0	$1,200–$1,299	83	449	1.8	8.3
$300–$399	37	150	.6	98.0	$1,300–$1,399	33	299	1.2	6.5
$400–$499	72	2,220	8.9	97.4	$1,400–$1,499	27	923	3.7	5.3
$500–$599	97	5,986	24.0	88.5	$1,500–$1,599	23	75	.3	1.6
$600–$699	142	3,542	14.2	64.5	$1,600–$1,699	14	125	.5	1.3
$700–$799	150	3,791	15.2	50.3	$1,700–$1,799	7	50	.2	.8
$800–$899	135	3,193	12.8	35.1	$1,800–$1,899	11	125	.5	.6
$900–$999	119	1,247	5.0	22.3	$1,900–$1,999	7	25	.1	.1

[1] Data in this table limited to census returns from the 8 cities shown in Table 114, p. 230.

TABLE I.—WAGE EARNERS DISTRIBUTED ACCORDING TO THE PER CAPITA MONEY EARNINGS ESTIMATED TO HAVE BEEN RECEIVED IN 1919 IN THE ESTABLISHMENTS IN WHICH THEY WERE EMPLOYED, BY CITIES [1]

CLASS OF EARNINGS	Number of establishments	WAGE EARNERS			CLASS OF EARNINGS	Number of establishments	WAGE EARNERS		
		Number	Per cent in each group	Cumulative per cent			Number	Per cent in each group	Cumulative per cent
BOSTON (Weighted average, $1,129)									
Total	580	27,299	100.0		$1,500–$1,599	29	874	3.2	13.2
					$1,600–$1,699	18	764	2.8	10.0
Less than $300	13	27	0.1	100.0	$1,700–$1,799	11	519	1.9	7.2
$300–$399	9	55	.2	99.9	$1,800–$1,899	8	464	1.7	5.3
$400–$499	13	109	.4	99.7	$1,900–$1,999	8	792	2.9	3.6
$500–$599	19	355	1.3	99.3	$2,000–$2,099	3			.7
$600–$699	36	573	2.1	98.0	$2,100–$2,199	3	27	.1	.7
$700–$799	61	5,405	19.8	95.9	$2,200–$2,299	2	82	.3	.6
$800–$899	52	2,621	9.6	76.1	$2,500–$2,599	1			.3
$900–$999	44	2,102	7.7	66.5	$2,600–$2,699	1			.3
$1,000–$1,099	62	1,965	7.2	58.8	$2,700–$2,799	1			.3
$1,100–$1,199	65	2,457	9.0	51.6	$2,800–$2,899	1	82	.3	.3
$1,200–$1,299	51	3,685	13.5	42.6	$2,900–$2,999				
$1,300–$1,399	40	3,003	11.0	29.1	$3,000 and over	1			
$1,400–$1,499	28	1,338	4.9	18.1					

See footnote at end of table, p. 404.

TABLE I.—WAGE EARNERS DISTRIBUTED ACCORDING TO THE PER CAPITA MONEY EARNINGS ESTIMATED TO HAVE BEEN RECEIVED IN 1919 IN THE ESTABLISHMENTS IN WHICH THEY WERE EMPLOYED, BY CITIES [1]—Contd.

CLASS OF EARNINGS	Number of establishments	WAGE EARNERS			CLASS OF EARNINGS	Number of establishments	WAGE EARNERS		
		Number	Per cent in each group	Cumulative per cent			Number	Per cent in each group	Cumulative per cent
CHICAGO (Weighted average, $1,415)									
Total	1,734	96,857	100.0		$1,600–$1,699	78	3,390	3.5	15.0
					$1,700–$1,799	43	2,034	2.1	11.5
Less than $300	42	97	0.1	100.0	$1,800–$1,899	37	1,550	1.6	9.4
$300–$399	42	97	.1	99.9	$1,900–$1,999	31	6,199	6.4	7.8
$400–$499	42	484	.5	99.8	$2,000–$2,099	29	484	.5	1.4
$500–$599	63	1,647	1.7	99.3	$2,100–$2,199	11	291	.3	.9
$600–$699	87	1,937	2.0	97.6	$2,200–$2,299	10	97	.1	.6
$700–$799	95	2,518	2.6	95.6	$2,300–$2,399	10	194	.2	.5
$800–$899	117	5,036	5.2	93.0	$2,400–$2,499	7	97	.1	.3
$900–$999	138	5,327	5.5	87.8	$2,500–$2,599	3			.2
$1,000–$1,099	160	6,877	7.1	82.3	$2,600–$2,699	5			.2
$1,100–$1,199	159	10,170	10.5	75.2	$2,700–$2,799	2			.2
$1,200–$1,299	155	21,889	22.6	64.7	$2,800–$2,899	1	97	.1	.2
$1,300–$1,399	147	11,429	11.8	42.1	$2,900–$2,999	1	97	.1	.1
$1,400–$1,499	109	7,845	8.1	30.3	$3,000 and over	4			
$1,500–$1,599	108	6,974	7.2	22.2					
CLEVELAND (Weighted average, $1,343)									
Total	550	59,234	100.0		$1,400–$1,499	42	10,248	17.3	49.1
					$1,500–$1,599	47	7,049	11.9	31.8
Less than $300	15	59	0.1	100.0	$1,600–$1,699	29	6,575	11.1	19.9
$300–$399	7			99.9	$1,700–$1,799	15	1,066	1.8	8.8
$400–$499	7	59	.1	99.9	$1,800–$1,899	16	2,488	4.2	7.0
$500–$599	19	1,185	2.0	99.8	$1,900–$1,999	7	592	1.0	2.8
$600–$699	22	948	1.6	97.8	$2,000–$2,099	5	1,007	1.7	1.8
$700–$799	29	1,836	3.1	96.2	$2,100–$2,199	1			.1
$800–$899	40	2,903	4.9	93.1	$2,200–$2,299	1			.1
$900–$999	50	3,850	6.5	88.2	$2,300–$2,399	4	59	.1	.1
$1,000–$1,099	37	2,132	3.6	81.7	$2,400–$2,499	3			
$1,100–$1,199	38	3,021	5.1	78.1	$2,500–$2,599	1			
$1,200–$1,299	57	5,627	9.5	73.0	$2,600–$2,699	1			
$1,300–$1,399	56	8,530	14.4	63.5	$2,800–$2,899	1			
DETROIT (Weighted average, $1,399)									
Total	397	67,596	100.0		$1,400–$1,499	35	17,980	26.6	61.1
					$1,500–$1,599	28	15,006	22.2	34.5
Less than $300	4	406	0.6	100.0	$1,600–$1,699	20	2,433	3.6	12.3
$300–$399	3			99.4	$1,700–$1,799	23	2,636	3.9	8.7
$400–$499	4	68	.1	99.4	$1,800–$1,899	22	1,014	1.5	4.8
$500–$599	15	135	.2	99.3	$1,900–$1,999	9	1,690	2.5	3.3
$600–$699	18	1,284	1.9	99.1	$2,000–$2,099	8	203	.3	.8
$700–$799	18	1,690	2.5	97.2	$2,100–$2,199	3	68	.1	.5
$800–$899	23	2,636	3.9	94.7	$2,200–$2,299	4	68	.1	.4
$900–$999	25	541	.8	90.8	$2,300–$2,399	2			.3
$1,000–$1,099	31	1,284	1.9	90.0	$2,400–$2,499	3	203	.3	.3
$1,100–$1,199	26	1,555	2.3	88.1	$2,600–$2,699	2			
$1,200–$1,299	43	5,070	7.5	85.8	$2,700–$2,799	1			
$1,300–$1,399	27	11,626	17.2	78.3					
NEW YORK (Weighted average, $1,225)									
Total	7,534	185,410	100.0		$1,600–$1,699	284	5,747	3.1	17.7
					$1,700–$1,799	238	6,488	3.5	14.6
Less than $300	364	2,225	1.2	100.0	$1,800–$1,899	207	4,820	2.6	11.1
$300–$399	171	1,298	.7	98.8	$1,900–$1,999	164	3,893	2.1	8.5
$400–$499	231	3,367	1.8	98.1	$2,000–$2,099	146	2,595	1.4	6.4
$500–$599	338	9,269	5.0	96.3	$2,100–$2,199	104	2,225	1.2	5.0
$600–$699	434	7,971	4.3	91.3	$2,200–$2,299	72	1,112	.6	3.8
$700–$799	501	13,718	7.4	87.0	$2,300–$2,399	56	1,483	.8	3.2
$800–$899	534	10,937	5.9	79.6	$2,400–$2,499	54	927	.5	2.4
$900–$999	580	12,420	6.7	73.7	$2,500–$2,599	31	556	.3	1.9
$1,000–$1,099	584	20,763	11.2	67.0	$2,600–$2,699	27	742	.4	1.6
$1,100–$1,199	534	13,162	7.1	55.8	$2,700–$2,799	29	556	.3	1.2
$1,200–$1,299	513	15,201	8.2	48.7	$2,800–$2,899	18	371	.2	.9
$1,300–$1,399	425	13,904	7.5	40.5	$2,900–$2,999	11	185	.1	.7
$1,400–$1,499	402	16,128	8.7	33.0	$3,000 and over	81	1,112	.6	.6
$1,500–$1,599	391	12,235	6.6	24.3					

See footnote at end of table, p. 404

TABLE 1.—WAGE EARNERS DISTRIBUTED ACCORDING TO THE PER CAPITA MONEY EARNINGS ESTIMATED TO HAVE BEEN RECEIVED IN 1919 IN THE ESTABLISHMENTS IN WHICH THEY WERE EMPLOYED, BY CITIES [1]—Contd.

CLASS OF EARNINGS	Number of establishments	WAGE EARNERS			CLASS OF EARNINGS	Number of establishments	WAGE EARNERS		
		Number	Per cent in each group	Cumulative per cent			Number	Per cent in each group	Cumulative per cent
PITTSBURGH (Weighted average, $1,423)									
Total	880	46,708	100.0		$1,300–$1,399	34	2,243	4.8	78.8
					$1,400–$1,499	41	7,102	15.2	74.0
Less than $300	12	964	2.0	100.0	$1,400–$1,499	36	10,539	22.6	58.8
$300–$399	11	93	.2	98.0	$1,500–$1,599	28	4,205	9.0	36.2
$400–$499	10	421	.9	97.8	$1,600–$1,699	10	1,448	3.1	27.2
$500–$599	17	337	.7	96.9	$1,700–$1,799	10	2,897	6.2	24.1
$600–$699	16	807	1.8	96.2	$1,800–$1,899	10	1,121	2.4	17.9
$700–$799	20	2,523	5.4	94.4	$1,900–$1,999	2	47	.1	15.5
$800–$899	22	1,402	3.0	88.5	$2,000–$2,099	5	7,149	15.3	15.4
$900–$999	20	1,178	2.5	85.5	$2,800–$2,899	1	47	.1	.1
$1,000–$1,099	28	421	.9	84.0	$2,500–$2,599	1			
$1,100–$1,199	23	2,309	4.8	83.1					
SAN FRANCISCO (Weighted average, $1,215)									
Total	427	8,650	100.0		$1,500–$1,599	32	1,184	12.3	25.9
					$1,600–$1,699	23	289	3.0	13.6
Less than $300	15	48	0.5	100.0	$1,700–$1,799	18	241	2.5	10.6
$300–$399	14	58	.6	99.5	$1,800–$1,899	16	241	2.5	8.1
$400–$499	17	193	2.0	98.9	$1,900–$1,999	6	10	.1	5.6
$500–$599	20	414	4.3	96.9	$2,000–$2,099	9	39	.4	5.5
$600–$699	18	183	1.9	92.6	$2,100–$2,199	11	298	3.1	5.1
$700–$799	26	790	8.1	90.7	$2,200–$2,299	4	19	.2	2.0
$800–$899	21	693	7.2	82.6	$2,300–$2,399	5	29	.3	1.8
$900–$999	23	1,367	14.2	75.4	$2,400–$2,499	3	19	.2	1.5
$1,000–$1,099	24	549	5.7	61.2	$2,500–$2,599	2			1.3
$1,100–$1,199	31	539	5.6	55.5	$2,700–$2,799	2	19	.2	1.3
$1,200–$1,299	32	790	8.1	49.9	$2,800–$2,899	1	39	.4	1.1
$1,300–$1,399	28	1,040	10.8	41.8	$2,900–$2,999	3	10	.1	.7
$1,400–$1,499	22	491	5.1	31.0	$3,000 and over	2	58	.6	.6
ST. LOUIS (Weighted average, $1,042)									
Total	821	31,097	100.0		$1,300–$1,399	27	1,088	3.5	20.8
					$1,400–$1,499	28	2,768	8.9	17.3
Less than $300	12	81	0.1	100.0	$1,500–$1,599	29	1,244	4.0	8.4
$300–$399	8	93	.3	99.9	$1,600–$1,699	15	684	2.2	4.4
$400–$499	13	218	.7	99.6	$1,700–$1,799	6	311	1.0	2.2
$500–$599	20	435	1.4	98.9	$1,800–$1,899	7	93	.3	1.2
$600–$699	41	2,302	7.4	97.5	$1,900–$1,999	6	187	.6	.9
$700–$799	57	2,861	9.2	90.0	$2,000–$2,099	4	31	.1	.3
$800–$899	54	6,251	20.1	80.8	$2,100–$2,199	2	31	.1	.2
$900–$999	51	4,727	15.2	60.7	$2,300–$2,399	1			.1
$1,000–$1,099	52	2,868	9.6	45.5	$2,400–$2,499	1	31	.1	.1
$1,100–$1,199	48	2,550	8.2	35.9	$3,000 and over	1			
$1,200–$1,299	41	2,146	6.9	27.7					

[1] Data in this table limited to census returns from the 20 industries listed in Table 114, p. 230.

TABLE J.—CALCULATION OF COMPLETE SERIES OF PREVAILING HOURS WORKED PER WEEK

[Except where specified in the footnotes the U. S. Bureau of Labor Statistics index numbers utilized are those for "all industries," the latter being computed from the bureau's separate industry indices by I. M. Rubinow in the article cited in footnote 1]

INDUSTRY	1899	1904	1909	1914	1919	1921
All industries:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4	[2] 90.1		
B. L. S. indexes (1909=100)	105.0	102.0	100.0	96.0		
Full-time hours per week [3]	59.6	57.9	56.8	55.1	50.8	50.3
Bread and other bakery products: [4]						
B. L. S. indexes (1890–1899=100)	97.8	93.6	88.6			
B. L. S. indexes (1909=100)	110.4	105.6	100.0			
Full-time hours per week	64.2	61.4	58.2	55.5	50.3	50.5
Confectionery and ice cream:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1909=100)	105.1	101.7	100.0			
Full-time hours per week	58.8	56.9	55.9	54.8	51.2	51.7
Flour-mill and gristmill products:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1909=100)	105.1	101.7	100.0			
Full-time hours per week	64.2	62.1	61.1	60.1	55.1	54.5
Slaughtering and meat packing, wholesale:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4	[2] 90.1		
B. L. S. indexes (1914=100)	110.1	106.5	104.8	100.0		
Full-time hours per week	64.0	61.9	60.9	58.1	49.0	48.6
Slaughtering, wholesale, not including meat packing:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4	[2] 90.1		
B. L. S. indexes (1914=100)	110.1	106.5	104.8	100.0		
Full-time hours per week	61.2	59.2	58.2	55.6	49.6	48.6
Liquors, malt:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1909=100)	105.1	101.7	100.0			
Full-time hours per week	53.8	52.0	51.2	48.6	47.9	47.6
Mineral and soda waters:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1909=100)	105.1	101.7	100.0			
Full-time hours per week	59.7	57.7	56.8	55.8	53.0	51.6
Tobacco, cigars and cigarettes:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4	[2] 90.1		
B. L. S. indexes (1914=100)	110.1	106.5	104.8	100.0		
Full-time hours per week	57.3	55.5	54.6	52.1	49.8	49.4
Carpets and rugs, other than rag:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1909=100)	105.1	101.7	100.0			
Full-time hours per week	59.8	57.9	56.9	54.1	50.2	49.2
Clothing, men's:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1909=100)	105.1	101.7	100.0			
Full-time hours per week	56.3	54.4	53.5	50.6	43.8	43.7
Clothing, women's:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1909=100)	105.1	101.7	100.0			
Full-time hours per week	55.3	53.6	52.7	50.6	43.8	43.8
Cotton goods: [5]						
B. L. S. indexes (1890–1899=100)	100.3	99.2	96.4	[2] 92.6		
B. L. S. indexes (1914=100)	108.3	107.1	104.1	100.0		
Full-time hours per week	61.6	60.9	59.2	56.9	52.8	52.6
Dyeing and finishing textiles, exclusive of that done in textile mills:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1909=100)	105.1	101.7	100.0			
Full-time hours per week	60.5	58.5	57.6	55.3	49.3	49.7
Knit goods: [6]						
B. L. S. indexes (1890–1899=100)	100.2	97.8	96.6			
B. L. S. indexes (1909=100)	103.7	101.2	100.0			
Full-time hours per week	59.8	58.3	57.6	54.8	50.7	50.8
Shirts:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1909=100)	105.1	101.7	100.0			
Full-time hours per week	57.6	55.7	54.8	52.8	47.7	47.4

[1] From I. M. Rubinow "Recent trend of real wages," 4 Amer. Econ. Rev. 810 (December, 1914), where the B. L. S. relatives are assembled. Average for 1890–1899=100. This note also applies to the industry groups.

[2] Douglas, P. H., 11 American Economic Review, p. 413 (September, 1921).

[3] Figures for 1909–1921, inclusive, are weighted averages computed from census data on prevailing hours of work per week. The figures for 1899 and 1904 are calculated on the bases of the series of relatives on the 1909 base.

[4] U. S. B. L. S. indexes used: Bakers.

[5] U. S. B. L. S. indexes used: Cotton goods.

[6] U. S. B. L. S. indexes used: Knit goods.

TABLE J.—CALCULATION OF COMPLETE SERIES OF PREVAILING HOURS WORKED PER WEEK—Continued

[Except where specified in the footnotes the U. S. Bureau of Labor Statistics index numbers utilized are those for "all industries," the latter being computed from the bureau's separate industry indexes by I. M. Rubinow in the article cited in footnote 1]

INDUSTRY	1899	1904	1909	1914	1919	1921
Silk goods:[7]						
B. L. S. indexes (1890–1899=100)	99.5	97.2	97.5			
B. L. S. indexes (1909=100)	102.1	99.7	100.0			
Full-time hours per week	57.5	56.2	56.3	54.7	48.2	48.5
Woolen goods:[8]						
B. L. S. indexes (1890–1899=100)	100.0	97.9	97.8			
B. L. S. indexes (1909=100)	102.2	100.1	100.0			
Full-time hours per week	59.1	57.9	57.8	55.7	50.5	50.6
Worsted goods:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1909=100)	105.1	101.7	100.0			
Full-time hours per week	59.6	57.6	56.7	54.7	48.6	49.1
Boots and shoes:[9]						
B. L. S. indexes (1890–1899=100)	99.6	97.1	95.7			
B. L. S. indexes (1909=100)	104.1	101.5	100.0			
Full-time hours per week	58.2	56.8	55.9	54.3	48.7	48.5
Leather, tanned, curried, and finished:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1909=100)	105.1	101.7	100.0			
Full-time hours per week	60.5	58.6	57.6	56.5	50.4	50.8
Furniture:[10]						
B. L. S. indexes (1890–1899=100)	100.3	97.3	95.5	94.3		
B. L. S. indexes (1914=100)	106.4	103.2	101.3	100.0		
Full-time hours per week	59.0	57.2	56.1	55.4	52.5	50.9
Lumber and timber products:[11]						
B. L. S. indexes (1890–1899=100)	99.8	97.8	96.5			
B. L. S. indexes (1914=100)	103.4	101.3	100.0			
Full-time hours per week	61.5	60.2	59.5	59.6	56.1	56.1
Lumber, planing-mill products:[12]						
B. L. S. indexes (1890–1899=100)	99.2	97.9	96.7	[1] 94.3		
B. L. S. indexes (1914=100)	105.2	103.8	102.5	100.0		
Full-time hours per week	57.3	56.6	55.9	54.5	52.1	50.4
Paper and wood pulp:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	64.4	62.4	61.3	59.5	51.7	52.1
Printing and publishing, newspapers and periodicals:[13]						
B. L. S. indexes (1890–1899=100)	97.9	95.7	94.4	[1] 93.8		
B. L. S. indexes (1914=100)	104.4	102.0	100.6	100.0		
Full-time hours per week	50.6	49.4	48.7	48.4	48.2	47.4
Printing and publishing, book and job:[14]						
B. L. S. indexes (1890–1899=100)	97.2	92.4	86.8	[1] 85.5		
B. L. S. indexes (1914=100)	113.7	108.1	101.5	100.0		
Full-time hours per week	54.3	51.6	48.4	47.7	47.9	46.1
Chemicals:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	64.4	62.3	61.3	60.6	52.6	50.3
Petroleum refining:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	61.9	59.9	58.9	58.4	51.2	51.1
Brick and tile, terra-cotta, and fire-clay products:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	60.5	58.6	57.6	56.5	54.4	53.6
Glass:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	57.6	55.8	54.8	53.2	48.9	48.8
Automobile bodies and parts:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4	[1] 90.1		
B. L. S. indexes (1914=100)	110.1	106.5	104.8	100.0		
Full-time hours per week	60.4	58.5	57.5	54.9	50.7	50.6

[1] Douglas, P. H., 11 American Economic Review, p. 413 (September, 1921).
[7] U. S. B. L. S. indexes used: Silk goods.
[8] U. S. B. L. S. indexes used: Woolen goods.
[9] U. S. B. L. S. indexes used: Boots and shoes.
[10] U. S. B. L. S. indexes used: Furniture.
[11] U. S. B. L. S. indexes used: Lumber.
[12] U. S. B. L. S. indexes used: Millwork.
[13] U. S. B. L. S. indexes used: Printing, newspapers.
[14] U. S. B. L. S. indexes used: Printing, book and job.

TABLE J.—CALCULATION OF COMPLETE SERIES OF PREVAILING HOURS WORKED PER WEEK—Continued

[Except where specified in the footnotes the U. S. Bureau of Labor Statistics index numbers utilized are those for "all industries," the latter being computed from the bureau's separate industry indexes by I. M. Rubinow in the article cited in footnote 1]

INDUSTRY	1899	1904	1909	1914	1919	1921
Automobile repairing:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4	[3] 90.1		
B. L. S. indexes (1914=100)	110.1	106.5	104.8	100.0		
Full-time hours per week	59.9	57.9	57.0	54.4	53.0	49.1
Automobiles:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4	[3] 90.1		
B. L. S. indexes (1914=100)	110.1	106.5	104.8	100.0		
Full-time hours per week	58.3	56.4	55.5	52.9	49.6	49.1
Cars, steam-railroad: [15]						
B. L. S. indexes (1890–1899=100)	101.1	96.8	95.4			
B. L. S. indexes (1914=100)	106.0	101.5	100.0			
Full-time hours per week	60.5	57.9	57.0	55.7	51.3	51.3
Railroad repair shops—electric:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	61.7	59.7	58.7	57.2	52.8	52.5
Iron and steel, blast furnaces:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	76.3	73.8	72.6	69.1	62.7	62.6
Iron and steel, steel works and rolling mills:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	64.2	62.1	61.1	59.0	55.1	43.0
Foundry and machine-shop products: [16]						
B. L. S. indexes (1890–1899=100)	99.4	94.6	93.8	[3] 92.0		
B. L. S. indexes (1914=100)	108.0	102.8	102.0	100.0		
Full-time hours per week	58.9	56.0	55.6	54.5	51.0	49.7
Brass, bronze, and copper products:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	59.2	57.2	56.4	54.9	51.9	51.0
Cars and general shop construction and repairs by steam-railroad companies: [15]						
B. L. S. indexes (1890–1899=100)	101.1	96.8	95.4			
B. L. S. indexes (1914=100)	106.0	101.5	100.0			
Full-time hours per week	59.6	57.0	56.2	54.1	49.8	50.0
Agricultural implements:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	59.7	57.8	56.8	55.5	52.5	50.4
Rubber tires, tubes, and rubber goods:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	58.9	57.0	56.1	54.3	49.3	49.4
Shipbuilding, steel:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	59.2	57.3	56.3	51.7	43.7	44.3
Electrical machinery, apparatus, and supplies:						
B. L. S. indexes (1890–1899=100)	99.2	96.0	94.4			
B. L. S. indexes (1914=100)	105.1	101.7	100.0			
Full-time hours per week	57.5	55.6	54.7	53.5	49.1	48.2

[3] Douglas, P. H., 11 American Economic Review, p. 413 (September, 1921).
[15] U. S. B. L. S. indexes used: Car building.
[16] U. S. B. L. S. indexes used: Foundry and machine shops.

TABLE K.—PROPORTIONS OF ALL MANUFACTURING WAGE EARNERS EMPLOYED IN EACH OF THE 41 INDUSTRIES AND IN EACH INDUSTRIAL GROUP, BY CENSUS YEARS: 1899–1925

[The average number of wage earners for each of the census years 1899–1923 for all industries combined is shown in Table C, p. 384]

INDUSTRY	1899	1904	1909	1914	1919	1921	1923	1925
All industries, total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
41 selected industries [1]	70.81	74.67	75.40	68.27	68.27	69.48	70.47	69.70
Food, tobacco, and beverages	10.4	10.7	9.9	10.8	9.9	10.9	9.2	------
Food and kindred products	6.4	6.5	6.2	7.0	7.5	8.2	7.1	------
Bread and other bakery products	1.28	1.49	1.51	1.76	1.56	2.14	1.85	1.91
Flour-mill and gristmill products	.68	.72	.60	.56	.50	.51	.40	.38
Confectionery	.57	.66	.67	[3] .76	.84	[3] .88	.72	.76
Slaughtering and meat packing	1.45	1.38	1.36	1.40	1.78	1.68	1.51	1.44
Liquors and beverages	1.2	1.3	1.2	1.3	.7	.5	.4	------
Liquors, malt	.84	.88	.83	.88	.38	.27	.13	------
Mineral and soda waters	.19	.20	.20	.22	.19	.21	.21	.33
Tobacco manufactures	2.8	2.9	2.5	2.5	1.7	2.2	1.7	------
Tobacco, cigars and cigarettes	2.19	[4] 2.92	[4] 2.52	2.71	1.53	1.92	1.48	1.40
Textiles, carpets, and leather	27.0	25.9	25.4	25.8	21.6	25.8	23.5	------
Textiles and their products	21.7	21.1	21.7	21.4	17.7	21.8	19.6	------
Carpets and rugs	.60	.61	.50	.44	.25	.33	.40	.40
Shirts	.78	------	.73	.74	.44	.65	.59	.59
Clothing, men's	2.57	[5] 2.89	2.89	2.47	1.93	2.38	2.22	2.08
Clothing, women's	1.78	2.12	2.32	2.40	1.82	2.09	1.52	1.51
Cotton manufactures	6.43	5.78	5.73	5.59	4.91	6.13	5.64	5.59
Dyeing and finishing textiles	.63	.65	.67	.69	.62	.74	.71	.84
Knit goods	1.78	1.90	1.95	2.14	1.90	2.33	2.21	2.23
Silk goods	1.39	1.46	1.50	1.54	1.30	1.75	1.43	1.58
Woolen and worsted goods	2.67	2.68	2.55	2.26	1.83	2.34	2.22	1.97
Leather and its finished products	5.3	4.8	4.7	4.4	3.9	4.0	3.9	------
Boots and shoes	3.01	2.93	3.00	2.72	2.32	2.64	2.57	2.47
Leather, tanned, curried, and finished	1.11	1.05	.94	.79	.80	.70	.68	.63
Lumber and timber products	14.2	13.3	13.7	12.0	9.2	9.7	10.2	------
Furniture	1.85	2.09	1.94	1.82	1.52	1.76	1.92	2.16
Lumber and timber products	8.77	9.74	10.50	6.82	5.29	5.24	5.65	5.65
Lumber, planning-mill products	1.56	1.79	1.70	1.37	.96	1.12	1.17	1.33
Paper and printing	6.3	6.4	6.3	6.4	5.6	6.7	6.0	------
Paper and wood pulp	1.05	1.21	1.15	1.26	1.25	1.52	1.38	1.48
Printing and publishing, book and job	1.43	1.60	1.64	1.61	1.35	1.74	1.48	1.59
Printing and publishing, newspapers	2.01	1.77	1.64	1.63	1.32	1.55	1.33	1.40
Stone, clay, glass, and chemicals	8.7	9.0	8.8	9.1	8.0	8.3	8.5	------
Chemicals and allied products	3.8	3.8	3.6	4.3	4.7	4.7	4.6	------
Chemicals	.32	.36	.36	.46	.61	.67	.85	.66
Petroleum refining	.26	.31	.21	.36	.65	.91	.76	.78
Stone, clay, and glass products	4.9	5.2	5.2	4.8	3.3	3.6	3.9	------
Brick and tile, terra-cotta, and fire-clay products	2.24	2.17	2.01	1.42	1.15	.99	1.59	1.66
Glass	1.12	1.17	1.04	1.06	.85	.79	.84	.83
Metals, vehicles, railroad cars, and miscellaneous	33.3	34.6	35.0	36.0	45.8	38.6	42.6	------
Iron and steel and their products	15.8	15.9	15.5	15.0	17.4	14.6	17.4	------
Iron and steel, blast furnaces	.83	.64	.58	.42	.46	.27	.42	.35
Iron and steel, steel works and rolling mills	3.89	3.80	3.63	3.35	4.12	3.39	4.42	4.42
Foundry and machine-shop products	7.43	8.11	8.03	5.15	5.31	4.63	5.11	4.74
Metals and metal products, other than iron and steel	3.4	3.6	3.8	3.7	3.7	3.4	3.7	------
Smelting and refining, copper, lead, and zinc	.52	.49	.45	.49	.41	.27	.44	.39
Vehicles for land transportation	2.8	2.5	3.1	3.7	5.5	4.1	5.8	------
Automobile bodies and parts	.04	.22	1.14	.68	1.46	1.00	1.86	2.72
Automobiles	.05	------	------	1.13	2.31	2.07	2.75	2.36
Cars, steam-railroad	.71	.62	.65	.77	.57	.65	.87	.57
Railroad repair shops	3.8	4.5	4.6	5.2	5.7	6.0	6.0	------
Railroad repair shops—electric	.15	.20	.34	.37	.34	.48	.40	.39
Railroad repair shops—steam	3.68	4.33	4.27	4.83	5.33	5.54	5.56	5.07
Miscellaneous	7.5	8.1	8.0	8.3	13.5	10.3	9.7	------
Agricultural implements	.99	.87	.76	.69	.60	.44	.35	.34
Rubber tires, inner tubes, and rubber goods, not elsewhere specified	.43	.39	.40	.71	1.32	1.10	1.56	1.38
Shipbuilding, steel	.66	.67	.43	.48	3.78	1.34	.59	.46
Electrical machinery, apparatus, and supplies	.89	1.11	1.32	1.68	2.33	2.32	2.68	2.86

[1] For 1899 and 1925 only 39 industries are included, data for "Chemicals" and "Automobile bodies and parts" for 1899, and "Liquors, malt," and "Mineral and soda waters" for 1925 not being available.
[2] 1914 Census of Manufactures, Vol. II, p. 936.
[3] Biennial Census of Manufactures, 1921, p. 81.
[4] Tobacco manufactures.
[5] Including shirts.

TABLE L.—PROPORTIONS BORNE BY THE MANUFACTURING WAGE EARNERS IN EACH STATE AND REGION TO THE TOTAL NUMBER OF MANUFACTURING WAGE EARNERS IN THE UNITED STATES, BY CENSUS YEARS: 1899–1923

[The average number of wage earners for each of the census years 1899–1923 for all industries combined is shown in Table C, p. 384]

REGION AND STATE	1899	1904	1909	1914	1919	1921	1923
United States	100.22	101.10	100.27	99.98	100.42	100.03	99.97
NORTHEAST							
New England:							
Maine	1.41	1.37	1.21	1.17	.97	1.09	.95
New Hampshire	1.33	1.19	1.19	1.12	.91	.97	.86
Vermont	.55	.61	.51	.46	.37	.37	.35
Massachusetts	9.36	8.93	8.84	8.62	7.85	8.34	7.60
Rhode Island	1.86	1.78	1.72	1.61	1.54	1.62	1.53
Connecticut	3.32	3.32	3.19	3.22	3.22	3.04	3.00
Middle Atlantic:							
New York	15.98	15.67	15.17	15.03	13.50	14.40	13.11
New Jersey	4.55	4.87	4.93	5.31	5.59	5.50	5.10
Pennsylvania	13.81	13.95	13.27	13.14	12.49	12.44	12.47
East North Central:							
Ohio	6.51	6.67	7.03	7.25	8.03	7.12	7.96
Indiana	2.93	2.82	2.83	2.81	3.05	2.97	3.32
Illinois	7.43	6.94	7.04	7.20	7.18	7.40	7.35
Michigan	3.05	3.20	3.50	3.85	5.18	4.38	5.73
Wisconsin	2.67	2.77	2.76	2.76	2.90	2.76	2.82
West North Central:							
Minnesota	1.45	1.27	1.28	1.32	1.72	1.24	1.18
Iowa	1.10	.90	.93	.90	.89	.90	.89
Missouri	2.54	2.43	2.31	2.16	2.14	2.25	2.24
North Dakota	.05	.03	.04	.05	.05	.04	.04
South Dakota	.06	.05	.05	.05	.07	.07	.06
Nebraska	.46	.37	.37	.36	.40	.40	.36
Kansas	.66	.65	.67	.59	.67	.65	.58
SOUTH							
South Atlantic:							
Delaware	.42	.34	.32	.31	.32	.26	.26
Maryland	2.04	1.72	1.63	1.59	1.54	1.54	1.47
District of Columbia	.46	.12	.12	.13	.12	.12	.11
Virginia	1.37	1.47	1.60	1.46	1.31	1.27	1.27
West Virginia	.63	.80	.97	1.01	.91	.87	.98
North Carolina	1.33	1.56	1.84	1.94	1.73	1.96	1.98
South Carolina	.91	1.09	1.10	1.02	.87	1.10	1.10
Georgia	1.58	1.70	1.58	1.48	1.36	1.41	1.57
Florida	.64	.77	.87	.79	.82	.77	.74
East South Central:							
Kentucky	1.18	1.09	.99	.92	.76	.85	.87
Tennessee	.95	1.11	1.12	1.06	1.05	1.09	1.21
Alabama	1.00	1.14	1.09	1.12	1.18	1.19	1.25
Mississippi	.50	.71	.76	.66	.63	.61	.62
West South Central:							
Arkansas	.50	.60	.60	.60	.55	.48	.51
Louisiana	.79	1.02	1.15	1.10	1.08	1.23	1.08
Oklahoma	[1].04	.06	.20	.25	.32	.32	.29
Texas	.91	.90	1.15	1.06	1.18	1.28	1.17
WEST							
Mountain:							
Montana	.19	.16	.18	.19	.19	.16	.18
Idaho	.28	.06	.12	.13	.15	.16	.19
Wyoming	.04	.03	.04	.04	.07	.10	.09
Colorado	.47	.40	.42	.39	.39	.40	.36
New Mexico	.05	.06	.06	.05	.06	.06	.06
Arizona	.06	.09	.10	.10	.09	.07	.10
Utah	.12	.15	.18	.20	.21	.19	.18
Nevada	.01	.01	.03	.05	.03	.03	.05
Pacific:							
Washington	.64	.83	1.04	.96	1.46	1.12	1.27
Oregon	.32	.34	.43	.41	.64	.58	.71
California	1.71	1.89	1.74	1.98	2.68	2.86	2.80

[1] Indian Territory not included in percentage for 1899; Indian Territory and Alaska not included in percentages for 1904.

APPENDIXES

APPENDIX I

SAMPLE WORK SHEET ILLUSTRATIVE OF PROCEDURE IN ESTIMATION OF AMOUNTS OF PER CAPITA EARNINGS, FOR ALL INDUSTRIES COMBINED: 1899–1927 [1]

[The figures in column D are derived from those in the two columns preceding in the following manner: The average weekly earnings (reported in Census Bulletin 93) for all manufacturing wage earners in the busiest week of 1904 were **$10.06.** This figure represents actual earnings; it is next, therefore, divided by an estimated ratio of actual to full employment (computed as explained in Chapter XV and XVI) in order to produce an estimate of full-time weekly earnings. This ratio, for all manufacturing industries, all sex and age groups combined, is **0.870.** The resulting full-time weekly earnings estimate for 1904 is **$11.56,** which becomes the 1904 figure for column D. The corresponding estimates for the other years are obtained by applying to the 1904 figure the index numbers of column B. The whole process of arriving at the estimates in column D is described in Chapter XIV of this monograph.]

YEAR	Estimated indexes of average wages [1]	Census average wage (intercensal years interpolated)	Relatives of per capita full-time money earnings		Estimated full-time weekly earnings [2]	Estimated "full-time yearly earnings" annual wages rates	Purchasing power of annual wage rates at 1914 price level	Actual per-capita earnings (nominal)	Real earnings per capita (at 1914 price level)	Cost of living index 1910=100	Estimated ratio actual to full employment
		A	B		D	I	J	N	P	H	M
			1904=1.000	1914=1.00							
1899	1.000	$426	0.890	0.73	$10.29	$525	$710	$446	$603	0.74	0.849
1900	1.032	440	.922	.76	10.66	544	716	449	591	.76	.825
1901	1.050	447	.937	.77	10.83	552	708	471	604	.78	.854
1902	1.074	458	.960	.79	11.10	566	708	497	621	.80	.878
1903	1.102	469	.983	.81	11.36	579	789	498	593	.84	.860
1904	1.000	477	1.000	.82	11.56	590	711	483	582	.83	.819
1905	1.020	487	1.021	.84	11.80	602	725	536	646	.83	.891
1906	1.060	506	1.061	.87	12.27	626	728	568	660	.86	.908
1907	1.102	526	1.103	.90	12.75	650	714	579	636	.91	.891
1908	1.091	520	1.090	.89	12.60	643	739	496	570	.87	.772
1909	1.000	518	1.090	.89	12.60	643	739	557	640	.87	.866
1910	1.021	529	1.109	.91	12.82	654	711	559	608	.92	.854
1911	1.034	536	1.124	.92	12.99	662	697	534	562	.95	.807
1912	1.070	554	1.161	.95	13.42	684	713	592	617	.96	.866
1913	1.112	576	1.208	.99	13.96	712	719	617	623	.99	.866
1914	1.000	580	1.220	1.00	14.10	719	719	576	576	1.00	.801
1915	1.021	592	1.241	1.02	14.35	732	747	608	620	.98	.831
1916	1.179	684	1.434	1.18	16.58	846	791	768	718	1.07	.908
1917	1.367	793	1.662	1.36	19.21	980	760	860	667	1.29	.878
1918	1.791	1,039	2.178	1.79	25.18	1,284	818	1,104	703	1.57	.860
1919	1.000	1,158	2.430	1.99	28.09	1,433	801	1,212	677	1.79	.846
1920	1.203	1,393	2.920	2.39	33.76	1,722	840	1,488	726	2.05	.864
1921	1.000	1,180	2.480	2.04	28.67	1,462	831	1,047	595	1.76	.716
1922	.976	1,152	2.415	1.98	27.92	1,424	858	1,171	705	1.66	.822
1923	1.000	1,267	2.656	2.18	30.70	1,566	927	1,317	839	1.69	.905
1924	.996	1,262	2.646	2.17	30.59	1,560	923	1,310	776	1.69	.840
1925	1.000	1,280	2.683	2.21	31.02	1,582	931	1,402	825	1.70	.886
1926	1.017	1,302	2.730	2.24	31.56	1,610	931	1,436	830	1.73	.892
1927	1.019	1,304	2.734	2.25	31.61	1,612	943	1,373	805	1.71	.852

[1] Derivation, data for intercensal years: 1900–1913, relatives of Massachusetts figures on average yearly earnings; 1915–1923, U. S. Bureau of Labor Statistics link relatives of per capita earnings, as chained by Federal Reserve Bank of New York, averaged with corresponding relatives for New York, Massachusetts (yearly), and Wisconsin, 1924–25, same as for period 1915–1923, except that the U. S. Bureau of Labor Statistics expanded reports on pay rolls and employment are used in place of the link relatives of per capita earnings, the bureau's indexes of pay-roll totals being divided by its indexes of employment for an index of per capita earnings; 1926–27, the indexes given rest entirely upon Federal data, being the quotients obtained by dividing the U. S. Bureau of Labor Statistics indexes of pay roll by its indexes of employment. This first column is in no way involved in the calculation of results for census years.

[2] See headnote.

APPENDIX II

SAMPLE WORK SHEET ILLUSTRATIVE OF PROCESS OF CALCULATING RELATIVES OF PER CAPITA EARNINGS, FOR ALL INDUSTRIES COMBINED: 1899–1927

YEAR	Estimated relatives of average wages	Census average wage payments (intercensal years interpolated)	Relatives on 1914 base (indices of "full-time money earnings" per capita)	Relatives, purchasing power of "full-time money earnings"	Relatives of actual money earnings	Relatives of purchasing power of actual money earnings	Year to year per cent of change in real earnings	Cost of living index	Index of employment (from Table 146)	Same, on 1914 base
		A	IX	K	O	Q	PX	H		L
1899	1.000	$426	73	99	77	105		0.74	1.003	1.06
1900	1.032	440	76	99	78	103	−2.0	.76	.975	1.03
1901	1.050	447	77	98	82	105	2.2	.78	1.010	1.07
1902	1.074	458	79	98	86	108	2.8	.80	1.038	1.10
1903	1.102	469	81	96	86	103	−4.5	.84	1.017	1.07
1904	1.000	477	82	99	84	101	−1.9	.83	.968	1.02
1905	1.020	487	84	101	93	112	11.0	.83	1.052	1.11
1906	1.060	506	87	101	99	115	2.2	.86	1.073	1.13
1907	1.102	526	90	99	101	110	−3.6	.91	1.052	1.11
1908	1.091	520	89	103	86	99	−10.4	.87	.912	.96
1909	1.000	518	89	103	97	111	12.3	.87	1.024	1.08
1910	1.021	529	91	99	97	106	−5.0	.92	1.010	1.07
1911	1.034	536	92	97	93	98	−7.6	.95	.964	1.01
1912	1.070	554	95	99	103	107	9.8	.96	1.024	1.08
1913	1.112	576	99	100	107	108	1.0	.99	1.024	1.08
1914	1.000	580	100	100	100	100	−7.5	1.00	.947	1.00
1915	1.021	592	102	104	106	108	7.6	.98	.982	1.04
1916	1.179	684	118	110	133	125	15.8	1.07	1.073	1.13
1917	1.367	793	136	106	149	116	−7.1	1.29	1.038	1.10
1918	1.791	1,039	179	114	192	122	5.4	1.57	1.017	1.07
1919	1.000	1,158	199	111	210	118	−3.7	1.79	1.000	1.06
1920	1.203	1,393	239	117	258	126	7.2	2.05	1.021	1.08
1921	1.000	1,180	204	116	182	103	−18.0	1.76	.846	.89
1922	.976	1,152	198	119	203	122	18.5	1.66	.972	1.03
1923	1.000	1,267	218	129	229	146	+17.0	1.69	1.070	1.130
1924	.996	1,262	217	128	227	135	−7.5	1.69	.993	1.049
1925	1.000	1,280	220	130	243	143	+6.0	1.70	1.049	1.109
1926	1.017	1,302	224	130	249	144	+1.0	1.73	1.056	1.115
1927	1.019	1,304	224	131	238	140	−2.5	1.71	1.007	1.063

APPENDIX III

SECTIONS OF MANUFACTURES CENSUS SCHEDULES RELATING TO WAGES AND LABOR

1899

5. Persons employed (see instruction 5):

CLASSES	Greatest number employed at any one time during the year	Least number employed at any one time during the year	Total amount paid in wages or salaries during the year
Proprietors and firm members:			
Men			$
Women			$
Salaried officers of corporations			$
General superintendents, managers, clerks, and salesmen:			
Men			$
Women			$
All other employees, including pieceworkers:			
Men, 16 years and over			$
Women, 16 years and over			$
Children, under 16 years			$
TOTAL			$

AVERAGE NUMBER EMPLOYED DURING EACH MONTH

(Wage earners only, including pieceworkers. Do not include proprietors, firm members, officers, superintendents, managers, clerks, or salesmen)

MONTH	Men, 16 years and over	Women, 16 years and over	Children, under 16 years
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

6. Months in operation:
On full time, _____; on three-fourths time, _____; on half time, _____; on one-fourth time, _____; idle, _____.

1905 (1904)

5. Salaried employees:	Number	Total amount paid in salaries during the year
Salaried officers of corporations		$
Superintendents, managers, foremen, clerks, and other salaried employees:		
Men		$
Women		$
TOTAL		$

6. Wage earners, including pieceworkers: Do not include salaried employees reported above.	Greatest number employed at any one time during the year	Least number employed at any one time during the year	Total amount paid in wages during the year
Men 16 years and over			$
Women 16 years and over			$
Children under 16 years			$
TOTAL			$

Salaries and wages should include board or rent furnished as part compensation. Foremen receiving wages and performing work similar to that of the men over whom they have charge are to be reported as wage earners. If books do not show the separate amount of wages paid to men, women, and children, apportion the total wages for the year upon the basis of an average pay roll. Amounts paid for contract work, if not done by the regular employees, must not be included here, but reported in answer to Inquiry 8.

7. Average number of wage earners, including pieceworkers, employed during each month:

Do not include proprietors and firm members, or salaried officers, superintendents, managers, foremen, or clerks.

MONTH	Men 16 years and over	Women 16 years and over	Children under 16 years	MONTH	Men 16 years and over	Women 16 years and over	Children under 16 years
January				July			
February				August			
March				September			
April				October			
May				November			
June				December			

11. Classified earnings of wage earners, including pieceworkers, for the week during which the largest number of persons was employed:

For week ending ..... 1904. Distribute employees according to actual earnings (not rates) for one week only. If period of payment includes two weeks, or any time other than one week, reduce the pay roll to a weekly basis before entering the figures for this inquiry. Do not include proprietors, firm members, officials, superintendents, managers, foremen, or clerks.

EARNINGS PER WEEK	Total	Men 16 years and over, number	Women 16 years and over, number	Children under 16 years, number
Under $3 per week				
$3 and over, but under $4				
$4 and over, but under $5				
$5 and over, but under $6				
$6 and over, but under $7				
$7 and over, but under $8				
$8 and over, but under $9				
$9 and over, but under $10				
$10 and over, but under $12				
$12 and over, but under $15				
$15 and over, but under $20				
$20 and over, but under $25				
$25 and over				
Total number				
Total wages for the week	$	$	$	$

12. Time the factory was in operation:

Number of days in operation during the year	
Number of hours per day (under normal conditions)	
Number of hours per week (under normal conditions)	
Extra time during the year, total number of hours	

1909

2. Time in operation and hours worked:

NUMBER OF DAYS IN OPERATION DURING THE YEAR.....

Give the number of days the plant, or any part of it, was in operation during the year. Days when the establishment was shut down for repairs, or for other causes, and there was *no production* should *not* be included. Do not include Sundays and holidays, unless plant was in actual operation.

NUMBER OF HOURS NORMALLY WORKED BY WAGE EARNERS: (*a*) PER SHIFT ..... (*b*) PER WEEK .....

Give the prevailing practice followed during the year, without attempting to indicate variations from this practice. All that it is desired to know is the practice generally prevailing in respect to the hours of labor of employees.

4. Salaried employees: Number, December 15, 1909, as per pay roll.

If data are not obtainable for that day or month, give the data for nearest representative or normal day, and state day and month here .....

	Men	*Women*
Salaried officers of corporations		
Superintendents and managers		
Clerks, stenographers, salesmen, and other salaried employees		
Total		

5. Wage earners, including pieceworkers: Number, December 15, 1909, as per pay roll.

If data are not obtainable for that day or month, give data for same day as for Inquiry 4. Include overseers and foremen receiving wages and performing work similar to men over whom they have charge; those whose duties are wholly supervisory should be reported under second item of Inquiry 4.

	Men	*Women*
16 years of age and over		
Under 16 years of age		
Total		

6. Wage earners, including pieceworkers. Number, as per pay rolls or time records on fifteenth day of each month of the period covered by this report.

If data are not obtainable for that day, give data for nearest representative day.

MONTH	NUMBER	MONTH	NUMBER	MONTH	NUMBER	MONTH	NUMBER
January		April		July		October	
February		May		August		November	
March		June		September		December	

7. Salary and wage payments: Total amounts paid in salaries and wages during the year covered by this report.

Do not include amount paid for contract work, if not done by the regular employees, as the amount paid for such work should be reported under Inquiry 9.

Salaried officers of corporations	$
Superintendents and managers	$
Clerks, stenographers, salesmen, and other salaried employees	$
Wage-earners, including pieceworkers	$
See note to Inquiry 5 as to overseers and foremen.	
Total	$

1914

3. Salaried employees: Number, December 15, 1914, as per pay roll:

If this is not a representative day, or if data are not obtainable for it, give the data for *nearest representative* or *normal day,* and state day and month here .....

	Male	*Female*
Salaried officers of corporations		
Superintendents and managers		
Clerks, stenographers, salesmen, and other salaried employees		
Total		

4. Wage earners, including pieceworkers: Number, December 15, 1914, as per pay roll:

If this is not a representative day, give data for same day as for Inquiry 3. Include overseers and foremen receiving wages and performing work similar to those over whom they have charge; those whose duties are wholly supervisory should be reported under second item of Inquiry 3.

	Male	*Female*
16 years of age and over		
Under 16 years of age		
Total		

5. Wage earners, including pieceworkers: Number, as per pay rolls or time records on fifteenth day of each month of the period covered by this report:

If data are not obtainable for that day, give data for nearest representative day.

Month	Number	Month	Number	Month	Number	Month	Number
January		April		July		October	
February		May		August		November	
March		June		September		December	

6. Total amounts paid in salaries and wages during the year covered by this report:

Salaried officers of corporations	$
Superintendents and managers	$
Clerks, stenographers, salesmen, and other salaried employees	$
Wage earners, including pieceworkers (See note to Inquiry 4 as to overseers and foremen.)	$
Total	$
Amount paid for contract work not done by the regular employees	$

7. Time in operation and hours worked:

NUMBER OF DAYS IN OPERATION DURING THE YEAR

Give the number of days the plant, or any part of it, was in operation during the year. Days when the establishment was shut down for repairs, or for other causes, and there was no production should not be included. Do not include Sundays and holidays unless plant was in actual operation.

NUMBER OF HOURS NORMALLY WORKED BY WAGE EARNERS: (*a*) PER SHIFT (*b*) PER WEEK

Give the prevailing practice followed during the year, without attempting to indicate variations from this practice. All that it is desired to know is the practice generally prevailing in respect to the hours of labor of employees.

1919

3. Salaried employees: Number, December 15, 1919, as per pay roll:

If this is not a representative day, or if data are not obtainable for it, give the data for *neares representative* or *normal day,* and state day and month here

	Male	*Female*
Salaried officers of corporations		
Superintendents, managers, and assistants		
Clerks, stenographers, salesmen, etc		
Total		

4. Wage earners, including pieceworkers: Number, December 15, 1919, as per pay roll:

If this is not a representative day, give data for same day as for Inquiry 3. Include overseers and foreman performing work similar to those over whom they have charge; those whose duties are wholly supervisory should be reported under second item of Inquiry 3. The number of persons working at their homes is not to be reported. The amount paid for such work, however, should be reported as "Amount paid for contract work, not done by the regular employees" and not under "Wage earners, including pieceworkers."

	Male	*Female*
16 years of age and over		
Under 16 years of age		
Total		

5. Wage earners, including pieceworkers: Number, as per pay rolls or time records on fifteenth day of each month of the period covered by this report:
If data are not obtainable for that day, give data for nearest representative day.

MONTH	NUMBER		MONTH	NUMBER		MONTH	NUMBER		MONTH	NUMBER	
	Male	Female		Male	Female		Male	Female		Male	Female
January			April			July			October		
February			May			August			November		
March			June			September			December		

6. Total amounts paid in salaries and wages during the year covered by this report:

Salaried officers of corporation	$
Superintendents, managers, and assistants	$
Clerks, stenographers, salesmen, etc	$
Wage earners, including pieceworkers (See note to Inquiry 4 as to overseers and foremen.)	$
Total	$
Amount paid for contract work not done by the regular employees	$

7. Time in operation and hours worked:

NUMBER OF DAYS IN OPERATION DURING THE YEAR
Give the number of days the plant, or any part of it, was in operation during the year. Days when shut down for repairs, or for other causes, and there was no production should not be included. Do not include Sundays and holidays, unless plant was in actual operation.

NUMBER OF HOURS NORMALLY WORKED BY WAGE EARNERS: (*a*) PER SHIFT (*b*) PER WEEK Give the prevailing practice followed during the year, without attempting to indicate variations from this practice. All that it is desired to know is the practice prevailing in respect to the hours of labor of employees.

1921

2. Persons engaged:

a. *Proprietors or firm members* number
b. *Officers, managers, clerks, and other salaried employees* on December 15, or nearest representative day
c. *Wage earners, including piece workers*, employed on the 15th day of each month, or nearest representative day, in the establishment here reported (*do not* include persons reported under items *a* and *b*):

Jan	Mar	May	July	Sept	Nov	
Feb	Apr	June	Aug	Oct	Dec	

3. Salary and wage payments:

a. Total amount of salaries for period covered by this report $
(Refers to Inquiry 2, item *b*, only.)
b. Total amount of wages for period covered by this report $
(Refers to Inquiry 2, item *c*, only.)
c. *Contract work* (amount paid for such work *not* done by the employees of the establishment here reported) $

4. Time in operation:

a. Number of days the factory was operated during the year
b. Number of hours normally worked by wage earners (per shift) (per week)

1923

3. Time in operation:

a. Number of days the factory was operated during the year_____

b. Number of hours normally worked by wage earners (per shift)_____(per week)_____

4. Persons engaged:

Number

a. Proprietors or firm members (not applicable to incorporated companies)___ _____

b. Salaried employees.—Include salaried officers of corporations, superintendents, managers, clerks, and all other salaried employees on December 15, or nearest representative day_____ _____

c. Wage earners, including piece workers, number employed on the 15th day of each month, or nearest representative day, in the establishment reported (*do not* include those reported under items 4 *a* and 4 *b*):

Jan_____ Feb_____ Mar_____ Apr_____ May_____ June_____
July_____ Aug_____ Sept_____ Oct_____ Nov_____ Dec_____

5. Salaries, wages, and materials:

(Do not duplicate any expense under items *a*, *b*, *c*, and *d*.)

a. SALARIES.—Total amount paid for the period covered by this report (refers to Inquiry 4, item *b*, only)_____ $_____

b. WAGES.—Total amount paid for the period covered by this report (refers to Inquiry 4, item *c*, only)_____ $_____

1925

3. Time in operation:

a. Number of days the plant was operated during the year_____

b. Number of hours normally worked by wage earners (per shift)_____(per week)_____

4. Persons engaged:

Do not report any person under more than one of items *a*, *b*, and *c*.

Number

a. Proprietor or firm members (not applicable to incorporated companies)_____ _____

b. Salaried employees.—Report the number of salaried officers of corporations, superintendents, managers, auditors, bookkeepers, collectors, clerks, and other supervisory and clerical employees on the pay roll on December 15, or nearest representative day_____ _____

c. Wage earners, including pieceworkers.—Report the number of all skilled and unskilled laborers, such as mechanics, machine operatives, assemblers, packers, etc., including pieceworkers, actually employed in the manufacturing operations of the establishment on the 15th day of each month or nearest representative day:

Jan_____ Feb_____ Mar_____ Apr_____ May_____ June_____
July_____ Aug_____ Sept_____ Oct_____ Nov_____ Dec_____

5. Salaries, wages, and materials:

Report only the specified expenses; overhead, capital, and miscellaneous expenses should *not* be included. Do not report any class of expenses under more than one of items *a*, *b*, *c*, and *d*.

a. Salaries.—Report the total amount paid to the salaried employees shown above (Inquiry 4, item *b*) during the period covered by this report_____ $_____

b. Wages.—Report the total amount paid to the wage earners shown above (Inquiry 4, item *c*) during the period covered by this report_____ $_____

APPENDIX IV

LIST OF SOURCES USED OR CITED

A. OFFICIAL

FEDERAL STATISTICS

BUREAU OF THE CENSUS:

Census of Manufactures. Quinquennial censuses of 1899, 1904, 1909, 1914, and 1919; biennial censuses of 1921, 1923, and 1925.

Census of Population. Decennial censuses of 1900, 1910, and 1920.

Census of Manufactures. Selected establishment schedules, returned in 1919 census of manufactures. (In the archives of the Bureau of the Census.)

Earnings of wage earners, 1905. Census Bulletin No. 93. (Also published as Part IV of the census of manufactures for 1905.) Data refer to the year 1904.

Employees and wages, by Davis R. Dewey. Special report of the Twelfth Census—"The Dewey Report." Classified wages data based on censuses of 1890 and 1900.

Report on the statistics of wages in the manufacturing industries, by Joseph D. Weeks—"The Weeks Report."

Survey of Current Business. Compiled and published monthly by the Bureau of the Census, the Bureau of Foreign and Domestic Commerce, and the Bureau of Standards.

Census wage statistics and number of persons employed, by M. O. Lorenz. Unpublished manuscript in files of the Bureau of the Census. (Dated June, 1910.)

BUREAU OF LABOR STATISTICS:

Prices and the cost of living. Monthly reports. Published also in the *Monthly Labor Review.*

Employment in selected industries. Monthly reports, 1915–1926. Published also in the *Monthly Labor Review.*

Series of bulletins on *Wages and hours of labor.*

Cost of living in the United States. Bulletin 357.

Industrial survey in selected industries, 1919. Bulletin 265.

Industrial unemployment. Bulletin 310.

The making and using of index numbers, by Wesley C. Mitchell (Part I of Bulletin 284; *Index numbers of wholesale prices in the United States and foreign countries*).

Standardization of industrial accident statistics. Bulletin 276.

CONGRESS:

Hearings before Committee on Labor on H. R. 11956, June 30, 1922 (67th Cong., 2d sess.). Reprint of a report on the relations between wages and production, prepared for the International Association of Machinists by The Labor Bureau, Inc., pp. 13–70.

Congressional Record, vol. 41, pp. 5488–5489 (August 16, 1921). U. S. Bureau of Labor Statistics monthly index numbers of employees on pay roll, January, 1915–May, 1921, for 13 industries.

Senate Executive Document No. 39 (35th Cong., 2d sess., March, 1859). Contains the report on manufactures of the census of 1850.

Senate Report No. 1394, by Mr. Aldrich, Senate Committee on Finance, March 3, 1893. *Wholesale prices, wages, and transportation.* "The Aldrich Report:" Pay roll data, 1840–1891.

FEDERAL RESERVE BANK OF NEW YORK:

Monthly series of chain relatives of average weekly earnings, 1915–1924, separately reported for each of 13 industries (unpublished). Based upon changes in per capita earnings reported by the U. S. Bureau of Labor Statistics.

STATE REPORTS

CONNECTICUT, Bureau of Labor Statistics. *Annual Reports.*

IOWA, Bureau of Labor Statistics. *Annual Reports.*

MASSACHUSETTS, Department of Labor and Industries. *Annual Statistics of Manufactures* and *Massachusetts Industrial Review.*

NEW JERSEY, Bureau of Labor Statistics. *Annual Reports.*

NEW YORK, Bureau of Labor Statistics. *Annual reports on statistics of unemployment among members of trade-unions, 1899–1914.*

—— Department of Labor (superseding the Bureau of Labor Statistics) *Annual Reports.*

——, —— *The Industrial Bulletin* (monthly). Monthly series of data on factory employment, average weekly earnings in factories, time lost, and overtime, etc.

——, —— *Course of employment in New York State from 1914 to 1921.* Special Bulletin No. 113, September, 1922.

WISCONSIN, Industrial Commission. *The Wisconsin Labor Market* (monthly).

B. UNOFFICIAL

BARNETT, GEORGE E. "Growth of labor organization in the United States." 30 *Quarterly Journal of Economics*, 838 (October, 1916), and 12 *American Economic Review*,44–55 (Supplement, March, 1922)

BERRIDGE, W. A. "Industrial employment in the present business cycle." *Review of Economic Statistics.* Prel. Vol. V, pp. 292–300. (October, 1923.)

Business cycles and unemployment. Reports and recommendations of a Committee of the President's Conference on Unemployment, including an investigation made under the auspices of the National Bureau of Economic Research. New York: McGraw-Hill, 1923.

COOMBS, WHITNEY. *Wages of unskilled labor in manufacturing industries in the United States, 1890–1924.* New York: Columbia University Press, 1926. 163 pp. (Studies in History, Economics, and Public Law, No. 283.)

DAY, EDMUND E. "Cyclical fluctuations in the volume of manufacture." *Review of Economic Statistics.* Prel. Vol. V, pp. 30–60 (January, 1923), and continuation of the same series in subsequent issues of the *Review* and of the *Weekly Letter* of the Harvard University Committee on Economic Research.

—— "An index of the physical volume of production." *Review of Economic Statistics*, September, 1920, and January, 1921.

DOUGLAS, PAUL H. "The movement of real wages and its economic significance" 16 *American Economic Review, Supplement*, pp. 17–53 (March, 1926).

—— *Real wages.* Pollak Foundation for Economic Research. (In press.)

DOUGLAS, PAUL H., and LAMBERSON, FRANCES. "The movement of real wages, 1890–1918." 11 *American Economic Review*, 409–26 (September, 1921). Continuation of I. M. Rubinow's consolidatoin of statistics of wages and hours of labor published by the United States Bureau of Labor Statistics. *American Economic Review*, December, 1914.

HART, HORNELL. Fluctuations in employment in cities of the United States, 1902–1917. (Pamphlet.) Studies from the Helen S. Trounstine Foundation Vol. I, No. 2, May 15, 1918). Cincinnati, 1918. pp. 47–59.

HARVARD UNIVERSITY, Committee on Economic Research. E. E. Day's index of the physical volume of production, in *Review of Economic Statistics*, 1920–1925, and *Weekly Letter* of the Harvard Economic Service, 1924–25.

JAMES, A. E. "The Dewey report on wages in manufacturing industries in the United States." Publication of the *American Statistical Association*, vol. 10. (September, 1907), pp. 319–44. The author combines the data for the 33 industries separately presented in the Dewey report on *Employees and Wages*, giving a weighted summary for all industries. The article contains a critical review of the Dewey report. Mr. James's results tally closely, but not exactly, with those obtained by Mr. H. L. Moore after a similar analysis.

KING, WILLFORD I. *Employment, hours, and earnings in prosperity and depression.* New York: *National Bureau of Economic Research.* 1923. "The results of an inquiry conducted by the National Bureau of Economic Research with the help of the Bureau of Markets and Crop Estimates of the United States Department of Agriculture and the Bureau of the Census of the United States Department of Commerce for the President's Conference on Unemployment."

MITCHELL, WESLEY C. "Methods of presenting statistics of wages." 9 Quarterly Publication of the American Statistical Association 325–43 (December, 1905).

MOORE, HENRY L. "The variability of wages." 22 *Political Science Quarterly* 62–73 (March, 1907). A summation and consolidation of the data in the Dewey report on *Employees and Wages.*

NATIONAL BUREAU OF ECONOMIC RESEARCH. *Employment, hours, and earnings in prosperity and depression.* New York, 1923.

—— *Growth of American trade unions, 1880–1923.* New York, 1924.

—— *Income in the United States, its amount and distribution, 1909–1919.* Vol. I, summary. New York: Harcourt, Brace & Co., 1921.

—— *Income in the United States, its amount and distribution, 1909–1919.* Vol. II. New York: National Bureau of Economics Research, 1922.

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APPENDIX V

RETURNS FROM 1927 MANUFACTURES CENSUS

INDUSTRY	Wage earners (average number)	Wages	Census average wage [1]
All manufacturing industries	8,353,977	$10,848,802,532	$1,299
Bread and other bakery products	171,995	236,225,862	1,373
Flour-mill and gristmill products	29,982	37,559,472	1,253
Confectionery	63,163	56,980,548	902
Slaughtering and meat packing	119,095	161,583,827	1,357
Liquors, malt [2]	26,972	36,100,934	1,338
Mineral and soda waters [2]			
Tobacco, cigars, and cigarettes	116,174	94,589,211	814
Carpets and rugs, other than rag	32,829	42,040,892	1,281
Shirts	57,216	42,997,827	752
Clothing, men's [3]	146,099	184,613,090	1,264
Clothing, women's	154,459	211,349,759	1,368
Cotton manufactures	467,596	380,909,543	815
Dyeing and finishing textiles, exclusive of that done in textile mills	73,851	91,697,219	1,242
Knit goods	190,283	188,163,458	989
Silk goods, including throwsters	127,643	140,053,588	1,097
Woolen and worsted goods	154,361	173,821,905	1,126
Boots and shoes, not including rubber boots and shoes	203,110	225,090,242	1,108
Leather, tanned, curried, and finished	52,924	67,887,231	1,283
Furniture	186,302	236,109,312	1,267
Lumber and timber products	418,168	413,361,954	989
Lumber, planing-mill products, not including planing mills connected with sawmills	96,589	126,139,713	1,306
Paper and wood pulp	123,360	162,002,097	1,313
Printing and publishing, book and job	141,278	240,392,870	1,702
Printing and publishing, newspapers and periodicals	119,399	231,150,683	1,936
Chemicals	50,510	75,261,188	1,490
Petroleum refining	71,234	113,716,705	1,596
Brick and tile, terra cotta, and fire-clay products	137,639	167,117,325	1,214
Glass	65,825	81,352,734	1,236
Iron and steel, blast furnaces	27,958	44,258,499	1,583
Iron and steel, steel works, and rolling mills	361,312	601,275,499	1,664
Foundry and machine-shop products	397,814	591,064,948	1,486
Smelting and refining, copper, lead, and zinc	30,510	44,799,809	1,468
Automobile bodies and parts	181,489	291,290,968	1,605
Automobiles	187,910	321,664,093	1,712
Cars, steam-railroad, not including operations of railroad companies [4]	38,031	60,624,856	1,594
Electric-railroad repair shops	31,584	48,391,897	1,532
Steam-railroad repair shops	397,088	600,516,555	1,512
Agricultural implements	33,346	46,415,459	1,392
Rubber goods, not elsewhere specified	36,893	45,930,934	1,245
Shipbuilding, steel [5]	55,014	87,081,444	1,583
Electrical machinery, apparatus, and supplies	241,566	336,238,750	1,392

[1] See initial paragraph on page 269.
[2] Reported as "Beverages."
[3] Includes work clothing.
[4] Includes electric-railroad cars.
[5] Includes wooden shipbuilding.

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